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STAFF APPRAISAL REPORT

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

April 16, 1984

Water Supply and Sewerage Division
Europe, Middle East and North Africa Regional Office

CURRENCY EQUIVALENTS

As of October 1983, the exchange rate of the Syrian Pound (S£) is:

US$1.0	=	S£ 3.9
S£ 1.0	=	US$0.2564

As of October 1983, the exchange rate of the Kuwaiti Dinar (KD) is:

US$ 1.0	=	KD 0.2924
KD 1.0	=	US$ 3.42

MEASURES AND EQUIVALENTS

1 kilometer	(km)	=	0.621 miles
1 millimeter	(mm)	=	0.03937 inches
1 liter	(l)	=	0.264 US gallons
1 cubic meter	(m^3)	=	264 US gallons
1 hectare	(ha)	=	2.471 acres
1 square meter	(m^2)	=	10.76 square feet
1 square foot	(sq.ft.)	=	0.09 square meter
1 metric ton	(t)	=	1000 kilograms
1 kilogram	(kg)	=	2.2046 pounds

ABBREVIATIONS AND ACRONYMS

GECOS	=	General Company for Sewerage
GECOP	=	General Company for Water Projects
GECEC	=	General Company for Engineering and Consulting
MHU	=	Ministry of Housing and Utilities
MPW	=	Ministry of Public Works and Water Resources
AFESD	=	Arab Fund for Economic & Social Development
BOD	=	Biochemical Oxygen Demand measured during five days at 20° C
SS	=	Suspended Solids

FISCAL YEAR

January 1 - December 31

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

LOAN AND PROJECT SUMMARY

Borrower: Syrian Arab Republic.

Loan Amount: US$30 Million, including front-end fee.

Terms: Seventeen years, including four years of grace, at the standard variable interest rate.

Project Description: The proposed project includes the first two significant sewage treatment plants in the country and has received top priority from the Government in its most recent budget. The proposed project constitutes the least cost solution towards wastewater treatment in the cities of Homs and Hama, the third and fourth largest cities in Syria. The project's primary objectives are: (i) to provide sewage treatment and disposal facilities for Homs (population 380,000) and Hama (population 215,000); (ii) to improve water quality in the Assi River flowing through Homs and Hama, which is adversely affected by the discharge of raw sewage; (iii) to connect new housing developments to the main sewerage networks; and (iv) to help organize the sewerage sector through the establishment of adequate institutional structures and the introduction of financial policies. The project would generate substantial economic benefits from the maintenance of existing irrigated perimeters downstream of both municipalities, increases in urban land values and the restoration of the fishing industry. The project components include: (a) installation of sewage treatment plants in Homs and Hama with a design capacity of 1.36 million (including industrial users) and 0.3 million inhabitant equivalent, respectively; (b) construction of trunk sewers (about 25 km); (c) establishment of sewerage authorities including construction of office building and workshops, supply of vehicles and maintenance equipment and training; and (d) provision of technical assistance and consultant services to supervise construction and undertake specialized studies, including financial policies and management studies. The project would directly benefit nearly 700,000 people by 1990. The main risks associated with the project are those arising from the fact that sewerage authorities are being established for the first time and those related to project implementation. Provisions for training and technical assistance, and adoption of financial policies aimed at making sewerage authorities financially viable should assist in minimizing project risks.

Estimated Project Cost:

Component	Local	Foreign	Total
	US$ Million		
Homs Treatment Plant	19.42	20.63	40.05
Hama Treatment Plant	14.28	14.86	29.14
Trunk Sewers Hama & Homs	17.84	6.63	24.47
Buildings & Workshops	2.82	1.54	4.36
Vehicles, O&M Equipment	0.28	0.99	1.27
Technical Assistance & Consulting	1.01	1.48	2.49
Training	0.42	1.30	1.72
Construction Supervision	2.06	-	2.06
Base Cost (December 1983 Prices)	58.13	47.43	105.56
Physical Contingencies	5.97	5.07	11.04
Price Contingencies	18.77	15.45	34.22
Front-end Fee	-	0.07	0.07
Total Financing Required	82.87	68.02	150.89

Financing Plan: The financing plan is as follows:

Sources:	Local	Foreign	Total
	US$ Million		
Bank	-	30.00	30.00
Arab Fund	-	17.10	17.10
GECOS (Internal Funds)	3.93	-	3.93
Government	78.94	20.92	99.86
Total	82.87	68.02	150.89

Estimated Disbursements:

	Bank Fiscal Year								
	1985	1986	1987	1988	1989	1990	1991	1992	1993
	US$ Million								
Annual	0.61	2.42	4.67	5.75	5.60	4.61	3.38	2.21	0.75
Cumulative	0.61	3.03	7.70	13.45	19.05	23.66	27.04	29.25	30.00

Economic Rate of Return: N/A

Maps: No. IBRD 14201R - General Setting.
No. IBRD 14202R - Principal Features Homs.
No. IBRD 14203R - Principal Features Hama.

SYRIAN ARAB REPUBLIC

STAFF APPRAISAL REPORT

HOMS AND HAMA SEWERAGE PROJECT

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This report was prepared by Messrs. Michel J. L. Pommier, and Alexander Velderman (EMPWS).

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HOMS & HAMA SEWERAGE PROJECT

STAFF APPRAISAL REPORT

I. WATER SUPPLY AND SEWERAGE SECTOR

Water Resources

1.01 Although the total volume of water available in Syria for urban, industrial and agricultural use is not a constraint, the uneven geographic distribution of water resources generates chronic supply shortages in some cities. The most important confined aquifers are the karstic limestones, dolomites and chalky limestones which produce the more significant springs supplying water to Damascus, Homs, Lattakia and Sweida. Surface water is provided from the Euphrates River which serves mainly Aleppo, from the Assi River, which provides for the needs of Hama and several small villages. The Barada River, which flows through Damascus, is used only for irrigation due to its polluted condition from urban sewage. The growing problem of pollution and the related increase in the cost of supply is particularly evident in Homs and Hama where new sources of water are located 32 km (ground water) and 90 km (surface water), respectively, from the center of these cities.

Sector Organization

1.02 The Ministry of Irrigation manages all water resources in the country. Eight water authorities in Damascus, Homs, Hama, Aleppo, Lattakia, Sweida, Raqqa and Idleb are responsible, under the tutelage of the Ministry of Housing and Utilities (MHU), for all aspects of water supply in their respective cities. In other municipalities the water supply systems are operated by municipal staff. At present there is neither a national nor a regional or municipal sewerage authority. Technical municipal services operate and manage existing sewerage networks in addition to their other responsibilities. They lack, in most cases, the managerial expertise and the financial resources to provide adequate services. MHU is responsible for general guidance and assistance to municipalities and existing water authorities. It has two departments at its headquarters in Damascus, one responsible for potable water supply and one for sewerage. These departments, assisted by expatriates, design facilities or provide supervision and advise in the design of source supply, water treatment plants, main distribution lines and reservoirs for water supply and of sewerage collection systems and small industrial sewage treatment facilities. The main problems that the Government faces in developing the sewerage sector are inadequate financial policies, institutional deficiencies, and slow manpower development. The problem of inadequate manpower development is caused by the shortage of skilled staff, by the absence of any formal training program in the sector and by a poor salary and wage structure for staff in public service as a whole. Aware of these difficulties, the Government has decided to restructure the sewerage sector by

establishing financially viable companies (para. 4.05) and instituting in Damascus, with the Arab Fund financial assistance, a training center specialized in water supply and sewerage operations. The municipalities are also responsible for solid waste collection and disposal.

Water Supply

1.03 The levels of access to water supply in Syria (measured in terms of house connections) are above average for the Middle East Region. This reflects the Government's strategy which emphasizes house connections in preference to public taps in both urban and rural areas except in small villages which do not have their own municipal technical services. In the past, urban water supply has been rightly given the highest priority. As a result, most of the cities enjoy a high service level. Public water authorities, established in the eight largest cities, operate extensive distribution networks serving nearly all households except those residing in unauthorized settlements. However, as a result of rural-urban migration and reduced investments in supply works during the early seventies, available water was no longer sufficient to meet the growing urban population's demand and large investments to expand the urban water supply systems were required in order to ensure adequate supply in the future. The Government, with the Bank's assistance, completed three projects to expand supply in the two largest cities of the country, Damascus and Aleppo. With the implementation of these and other planned projects, it is estimated that the urban population served by house connections could rise from the present level of about 72% to about 85% in 1990 possibly reaching 95% by year 2000. Rural population with access to public water supply could increase from about 60% at present to 75% in 1990 possibly reaching 80% by the turn of the century. These estimates reflect the Government's investment objectives.

Solid Waste

1.04 The Government intends to improve solid waste collection and disposal and a study carried out recently by MHU recommends the creation in each Mohafazat (governorate) of specialized public enterprises. A draft decree is being prepared.

Sewerage

1.05 Population growth, urbanization and industrial activity have created serious pollution problems in the main cities of Syria (para. 1.01). The major cities have comprehensive combined sewer networks although some centuries-old systems like in Damascus and Aleppo are no longer adequate to meet the cities' needs. None of the cities have sewage treatment plants and only a few large factories have treatment facilities. The discharge of untreated sewage into relatively small rivers with minimal dry weather flow causes these rivers to be heavily polluted, thus preventing their use as traditional sources of domestic water supply. Widespread use of the stream flow for irrigation of small agricultural plots is common. During periods when there is little flow in the water courses, the undiluted raw sewage used for irrigation creates serious health problems. From 1970 to 1983, at least six outbreaks of cholera took place in areas where sewage is utilized for contact irrigation, particularly in Homs, Hama and Aleppo.

1.06 It is estimated that about 70% of the urban population is at present connected to the municipal sewage collection systems. The quality of recently constructed sewerage networks is good and secondary networks extension is keeping pace with urban development. The percentage of urban buildings connected to the sewerage systems is expected to rise gradually to 90% by the year 2000.

1.07 In rural villages, most of the houses provided with private water connections possess individual wastewater disposal systems (seepage pits).

Government's Sector Objectives

1.08 The Government's primary objective in the sewerage sector consists of abating the pollution of rivers and water sources due to the discharge of urban and industrial raw sewage which creates serious health problems throughout the country. This objective is to be achieved through the construction of sewage treatment and disposal facilities in the largest urban communities, while continuing the development of sewerage secondary networks in all urban areas. The Government has given top priority to the proposed sewerage project in its most recent budget and intends to include the sewerage investments required in Aleppo, Damascus and Lattakia in its sixth development plan (1986-1990). The Government intends to implement its sectoral objectives by creating in each Governorate financially viable and technically capable sewerage institutions to operate, maintain and develop the sector.

Bank's Involvement in the Sector

1.09 The Bank's strategy is to assist the Government in developing the institutional framework, financial policies and operational practices within the sectoral institutions, in order to attain their service level and pollution control objectives. The Bank has helped to strengthen and develop the water authorities in Damascus and Aleppo and has made two loans and one credit totalling US$ 98.5 million for the development of water supply in these cities. An IDA Credit of US$15.0 million approved in 1973 (Credit 401-SYR) financed a priority phase of distribution works in Damascus and pollution control studies for the Barada and Assi Rivers. Supply works for Damascus, partly financed by a 1976 Bank loan of US$35.0 million (Loan 1241-SYR) were completed satisfactorily in April 1980, only about four months behind original contract schedule. The combined completion report on the first two Damascus Water Supply Projects (PCR of June 23, 1983) concluded that these projects had met their objectives of providing additional water to the increasing population in the areas served, and contributed greatly towards the development of the water authority into a technically sound and financially viable institution. The Bank's latest project in the sector is a US$48.5 million loan, (Loan 1458-SYR) for the construction of a 73 km transmission line between lake Assad and Aleppo, treatment plants expansion, improvements to existing distribution systems and engineering studies for sewage treatment facilities. All facilities are now in operation and the loan was closed by December 31, 1983. Credit 401-SYR also included the study of pollution control in the Barada and Assi Rivers, and feasibility and detail design studies for sewage treatment plants in Damascus, Homs and Hama. These studies are the basis for this project. In addition to the Homs and Hama Project, the Government has requested Bank assistance for three other sewerage projects in Aleppo, Damascus and Lattakia for which feasibility studies and detail design are completed.

II. POPULATION AND DEMAND FOR SERVICES IN THE PROJECT AREA

Population

2.01 The latest census, held in September 1981, reported a total urban population of 349,000 in Homs. Since the previous census of 1970 the population growth rate has averaged 4.5% per year, which is slightly above the national average for urban areas (4.3%). At this rate, the total population of Homs would double about every 22 years. However, because of physical and economic absorption capacity constraints, the average annual population growth rate projected by the Government in concurrence with consultants' estimates, averages 4.0% during the 1980s and declines to about 3% by 2010. Most of the expected population increase would be concentrated in the outskirts of the city along the river.

2.02 During the 1970-1981 period, the population of Hama increased from 138,000 to 214,000, at an average annual growth rate of about 4.1%. The population in Hama is expected to reach 400,000 by the year 2010. The population projections for Homs and Hama are shown in Annex 1.

2.03 In addition to the population of Homs and Hama, there are a number of villages along the banks of the Assi River that will benefit from reduced levels of river pollution resulting from the project. Most of these villages are inhabited by farmers. It is estimated that 41,000 persons live in the villages along the river between Homs and Hama and an additional 38,000 downstream between Hama and Lake Maharde. Most of these villages have been supplied by piped water in recent years.

2.04 Homs is the third largest city of the country and the second industrial area. The city has attracted a number of large industries due to its favorable location near Lake Qattineh and River Assi and at the junction of major roads to Damascus, Hama, Aleppo and the port cities of Tartous and Lattakia (Maps I and II). As a result of increasing industrial development, the city and its suburbs have expanded rapidly at an average growth rate of 4.6% during the last twenty years. A number of medium and heavy industries have been established in and around the city. These include the two major water users in the city - a sugar factory and a dyeing factory, which together generate about 90% of the existing industrial sewage flow or over 50% of total wastewater flow of the city area. Other major industries located inside the city limits and discharging their raw sewage into the Assi River are cotton spinning, dairy, tanneries and slaughterhouses. South of the city, an oil refinery, and a fertilizer (nitrogen) complex which have their own treatment facilities discharge their effluent into lake Qattineh or the river. The municipality is also developing a new industrial zone northeast of the city along the Hama road. By law these industries are compelled to treat their own sewage or to connect to municipal treatment plants.

2.05 As a result of the rapid population growth, unauthorized settlements developed in the outskirts of Homs. The Government's policy was to deprive these settlements of basic services as a means of discouraging increasing urban migration. After the 1977 cholera epidemic, the Government reversed its

policy and authorized the Water Authority and the municipality to serve these areas with water supply and sewerage. The project provides for extensions of the city's main sewerage lines to serve these settlements where the majority of urban poor is concentrated, i.e., about 17,000 inhabitants out of the 30,000 dwellers of these areas.

2.06 Hama is the fourth largest city in Syria with a long history as a strategic trading center and service town to the surrounding fertile agricultural area (Maps I and III). In recent years, these functions have been supplemented by the growth of some industry in and around the city - iron and steel works to the north and large cement works to the south in addition to the more traditional furniture making, foodstuffs and textile activities. Industrial development is however less important than in Homs.

Water Demand

2.07 Piped water is supplied through metered connections in both Homs and Hama by the local Public Water Authorities. About 85% of the total population in Homs is served by private connections, while the service level in Hama exceeds 95%. Projections of future water consumption by various categories of consumers based on the most recent data were reviewed by the appraisal mission and are shown in Annex 2.

2.08 The analysis of water use for Homs indicates that private water supplies (i.e., not supplied by local water authorities) accounted for 32% of the total water supply in 1982 or about 9.5 million m^3. These supplies are expected to increase only modestly in absolute terms, representing 14% of the total water supply by the year 2000. The dominant private supply is that for the sugar factory, which used some 7.7 million m^3 of water in 1982 and is projected to continue at that level in the future since no plan to expand or contract this factory production is foreseen. The major industries south of Homs, which abstract their water directly from Lake Qattineh or the river, are excluded from these projections since they are not served by the sewer system of Homs.

2.09 There are no significant private water supplies in Hama and industrial water consumption is relatively insignificant (Annex 3).

2.10 Per capita water consumption for those connected to the public system are comparable in both Homs and Hama (about 150 liters/capita/day) and are assumed to increase marginally in future. In Homs, however, a smaller percentage of the total population is connected to the public supply. This is partly due to the existence in Homs of many private wells, estimated to service about 22,000 people or 6.5% of the population in 1982 and projected to fall to 10,000 people or less than 1.5% of the population by 2000. Furthermore, about 8.5% of the population in Homs lives in unauthorized housing not connected to the water system (para. 2.05).

Sewerage Demand

2.11 Both sewer systems in Homs and Hama are of a combined type, transporting sanitary sewage in dry weather plus storm drainage in wet weather.

Neither town has sewage treatment and disposal facilities. All flows collected by existing sewers are discharged directly into the river without treatment. Detailed projected dry weather sewage flows and their characteristics are presented in Annex 4 and can be summarized as follows:

	Year				
	1983	1988	1993	1998	2002
Homs					
Mean daily dry weather flow (m3/s)	1.2	1.5	1.8	2.2	2.6
Biochemical oxygen demand (BOD_5 t/day)	58.3	63.8	70.4	78.6	86.6
Suspended solids (SS t/day)	55.8	62.9	71.3	81.5	92.3
Hama					
Mean daily dry weather flow (m3/s)	0.4	0.5	0.6	0.7	0.8
Biochemical oxygen demand (BOD_5 t/day)	11.5	13.2	15.0	17.2	19.0
Suspended solids (SS t/day)	17.1	19.7	23.3	25.5	28.3

2.12 These projected average sewage flows can be compared to flows in the Assi River, which have an annual average of about 8.1 m^3/s at each town, but are frequently as low as 1.7 m^3/s during prolonged periods in the winter and spring, when the storage reservoirs at Qattineh, and Rastan are being filled for the next irrigation season. These figures illustrate that discharges of untreated sewage at Homs are already approaching the volume of water flowing in the river during low flows causing noxious conditions along the river particularly downstream of the town. Although sewage volumes are less important in Hama, the location of the city downstream of Homs contributes to the increase of its pollution problems. Precipitation in both towns is limited, and characterized by drizzles through most of the rainy season (October to May). The annual average precipitation at Homs is 450 mm and 322 mm at Hama, distributed over 70 days. Rainfall intensities per hour are low. They do not exceed 5 mm during more than 8 days per year. During this period, the flows in the combined sewers system exceed several times the dry weather flows (Annex 4).

2.13 Per capita domestic sewage flows are comparable in both towns (around 140 liters/capita/day). Pollution loads from industries in Homs presently exceed those from domestic sewage. The bulk of this industrial wastewater originates from the sugar refinery. Industrial pollution loads in Hama amount to less than 15% of those from domestic sewage.

2.14 An estimated 85% of the residents of Homs are already connected to the sewers but certain areas on the eastern and southern sides of the town, including areas inhabited by the poorest segment of the community, presently lack service. In Hama, the situation is a little better, with more than 90% of the town residents already sewered. Both towns need extensions to the sewer networks, as well as trunk sewers to serve new developed areas.

2.15 Sewage flows from the two largest industries in Homs (sugar refinery and textile dyeing factory) and the largest industry in Hama (cotton spinning factory) will be diverted to the proposed treatment plants facilities. This arrangement represents the least cost solution for the treatment of industrial wastes discharged by these industries (paras. 3.06 and 5.07).

III. THE PROJECT

Genesis

3.01 The Bank's first lending operation in the sector (Credit 401-SYR), for the first Damascus water supply project in 1973, included pollution control studies of the Barada River, which flows through Damascus, and the Assi River flowing through Homs and Hama. Engineering consultants for these studies (Howard Humphreys of UK) were appointed towards the end of 1976. The consultants' work was essentially completed early in 1979 and reviewed by a panel of international experts selected with Bank assistance. Detailed designs and draft tender documents have been prepared for sewage treatment plants at Homs and Hama and were reviewed by the Bank (para. 3.09).

3.02 Bank staff have been monitoring progress on project proposals for Homs and Hama as part of the supervision of the Damascus Water Supply Project. In April and June 1978, preparation missions visited Syria to discuss possible sewerage projects for Homs, Hama and Damascus. The consultants' draft reports on pre-investment studies were available in mid-1978 and were the basic documents for the preappraisal mission which visited Syria in October 1978. Due to the magnitude of investments involved in the sewerage projects for the three cities, the Government decided to form a committee of ministers and senior officials to review the projects and to assess the priority to be given to each one. At the time, no decision was reached by the Government, and the Bank suspended preparation of the Homs and Hama Project.

3.03 In January 1980, after extensive discussions with the Government, the Bank decided to resume processing of the project. An appraisal mission visited Syria in March 1980 together with a mission of the Arab Fund interested in parallel-financing of the proposed project. Broad agreement was reached on the way to deal with the various outstanding issues, and particularly the establishment of a sewerage authority. A draft decree was handed to the mission, and it was then understood that if this authority could not be established before the Bank's Board presentation, its establishment would be a condition of effectiveness of the Bank's loan. The Arab Fund took the same position. In May 1980, however, the Syrian Government decided to suspend the ratification process of the proposed decree establishing a national sewerage authority, and instead, started reviewing different alternatives for the organizational aspects of the project. The Bank's internal processing of this project was again suspended. Following an extensive review of a number of options (para. 4.04), the Syrian Government concluded that the interests of the sector would be best served by creating public establishments for water supply and sewerage in each governorate. By fall 1982, a draft legislative decree was prepared and circulated through all Government Departments. By mid 1983, this decree received approval of all Ministeries concerned, the conference of Mayors and the Prime Minister. Following these developments, the Bank reactivated the project processing and sent an updating appraisal mission in October 1983.

Project Objectives

3.04 The main objective of the proposed project is to create and develop for the first time in Syria appropriate institutional, financial, and staff development and training structures in the sewerage sector. This is essential to achieve other objectives such as enhancing water quality in the Assi River, which is adversely affected by the discharge of untreated sewage from Homs and Hama, and improving environmental conditions in sections of Homs and Hama not adequately sewered. These objectives will be implemented through provision of:

(i) sewerage treatment and disposal facilities for Homs and Hama;

(ii) trunk sewers;

(iii) establishment of sewerage authorities;

(iv) sound financial policies in the sewerage sector; and

(v) technical assistance and training.

3.05 Sewerage treatment plants for Homs and Hama are the essence of the project. At present, there are no municipal sewage treatment plants in Syria and no specific laws or regulations governing treatment plant performance or setting water standards. A fundamental objective of the proposed project is to safeguard the environment and to develop institutional arrangements, particularly through legislation and training, in order to increase the economic efficiency of investments in the sector.

Technological Alternatives and Service Standards

3.06 A range of alternative technologies is possible for sewage treatment plants, dependent mainly on the specific objectives of the plants, the degree to which various contaminants are to be removed, and on relevant cost factors. For Homs and Hama the consultants (Howard Humphreys of U.K.) examined several alternatives in treatment methods, including waste stabilization ponds. They recommended, and the Bank agrees, secondary treatment plants in each case as being the appropriate technology for the combined treatment of domestic and industrial sewage and the least cost solution for constructing and operating the facilities (Project File, Document C1). The least cost alternatives are, for Homs, an activated sludge treatment plant, and for Hama, a biological filtration plant. These different treatment processes would also give Syria the opportunity to compare and monitor the performance of both systems under particular Syrian conditions. This would also provide also broader expertise for future treatment plants in other cities. The provision of secondary treatment and disinfection are needed to ensure a high degree of pathogenic destruction in view of frequent outbreaks of cholera and other waterborne diseases in the area (para. 1.07) and also to provide an adequate degree of treatment for the industrial wastes within each locality. The combined treatment of domestic and industrial wastes, with pretreatment of the latter only if necessary, represents the least cost solution for obtaining an acceptable treated effluent which can be discharged into the Assi River without creating pollution and related health hazards.

3.07 The combined sewage collection system in each town is practically complete and functions adequately, although local remedial measures are required. In the few residential areas not served, the municipalities are implementing secondary networks. Extensions of the combined sewerage network to serve future cities' developments will conform to the existing standards of service.

Project Description

3.08 The proposed project components are described in detail in document C2 of the Project File and depicted in Maps IBRD 14202R (Homs) and IBRD 14203R (Hama). Project components were grouped into two parts to permit parallel financing with the Arab Fund whose loan of KD 5.00 million (US$17.10 million equivalent) would cover most of the foreign exchange component of the electro-mechanical equipment and supply of other equipment of Part A. The proposed project includes:

Part A

(i) sewage treatment plant of the biological filter type for Hama, providing primary, secondary and sludge treatment including chlorination of the effluent before discharge.

Part B

(i) sewage treatment plant of the activated sludge type for Homs providing primary, secondary and sludge treatment including chlorination of the effluent before discharge;

(ii) trunk sewers to serve new areas of both towns as well as areas not presently sewered;

(iii) office buildings and workshops for the new sewerage companies;

(iv) operating and maintenance equipment and vehicles for the new sewerage authorities;

(v) technical assistance and consultancy services to assist with detailed design of trunk sewers, preparation of tender documents, tendering, procurement, construction supervision, initial operation of the project facilities, updating of sewerage master plan, establishment of organizational and accounting systems;

(vi) engineering studies for future extension of sewerage networks and treatment facilities in Homs and Hama;

(vii) financial policies study for the implementation of an appropriate cost recovery policy; and

(viii) staff training, including management and accounting personnel.

3.09 Final designs and draft tender documents have been prepared by the consultant (Howard Humphreys) for both treatment plants and associated equipment. These documents were reviewed by Bank staff and need some revisions to take into account that execution of civil work and supply and erection of electromechanical equipment will be carried out by different contractors (para. 3.18). These revisions will be carried out by the local consultant (GECEC) with the assistance of foreign experts. Proposals for trunk sewer additions and replacements in Homs and Hama are preliminary, based on the consultants' review of the sewerage master plans and existing sewers. Detailed requirement for trunk sewers will be worked out in the final design stage.

Cost Estimates

3.10 The estimated cost of the proposed project appears in Annex 5 and is summarized in the table below. It amounts to S£ 651.16 million (US$150.89 million) including a foreign exchange component of S£ 293.58 million (US$68.02 million), or 45% of the total cost. Identifiable taxes and duties amount to about 21% of the total cost.

HOMS AND HAMA SEWERAGE PROJECT
SUMMARY COST ESTIMATE

Base December 1983	Local	Foreign	Total	Local	Foreign	Total
	(S£ million)			(US$ million)		
Part A						
I. Hama treatment plant (CW)	52.02	46.09	98.11	13.33	11.82	25.15
Supply & Installation of Equipment	3.74	11.84	15.58	0.95	3.04	3.99
Sub-Total	55.76	57.93	113.69	14.28	14.86	29.14
Physical contingencies	5.76	6.39	12.15	1.47	1.64	3.11
Sub-Total	61.52	64.32	125.84	15.75	16.50	32.25
Price contingencies	30.16	36.03	66.19	5.25	6.09	11.34
Total Part A	91.68	100.35	192.03	21.00	22.59	43.59
Part B						
II. Homs treatment plant (CW)	68.37	66.81	135.18	17.53	17.13	34.66
Supply & Installation of Equipment	7.36	13.68	21.04	1.89	3.50	5.39

Base December 1983		Local	Foreign	Total	Local	Foreign	Total
		---- (S£ million) ---			--- (US$ million) ---		
III.	Trunk sewers Homs & Hama (CW)	68.64	21.34	89.98	17.60	5.47	23.07
	Supply of Equipment	0.92	4.50	5.42	0.24	1.16	1.40
IV.	Office bldg. & workshops (CW)	10.40	3.06	13.46	2.67	0.78	3.45
	Supply of Equipment	0.60	2.94	3.54	0.15	0.76	0.91
V.	Vehicles, O & M equipment	1.08	3.85	4.93	0.28	0.99	1.27
VI.	Tech. ass. & consulting Ser.	3.93	5.77	9.70	1.01	1.48	2.49
	Training	1.63	5.06	6.69	0.42	1.30	1.72
	Construction supervision	8.09	-	8.09	2.06	-	2.06
	Sub-Total	171.02	127.01	298.03	43.85	32.57	76.42
	Physical contingencies	17.52	13.38	30.90	4.50	3.43	7.93
	Sub-Total	188.54	140.39	328.93	48.35	36.00	84.35
	Price contingencies	77.38	52.51	129.89	13.52	9.36	22.88
	Total Part B	265.92	192.90	458.82	61.87	45.36	107.23
	Total Parts A and B	357.60	293.26	650.86	82.87	67.95	150.82
	Front-end fee	-	0.30	0.30	-	0.07	0.07
	Total Project Cost	357.60	293.56	651.16	82.87	68.02	150.89

3.11 The cost estimates are based on recent quotations for the treatment plants' electromechanical equipment offered to the Syrian Government and on current prices for civil works executed by state-owned companies (para. 3.18). Physical contingencies of 15% for supply of equipment and 10% for other project components have been added. Price contingencies of 12% for 1983, 10% for 1984 and 9% thereafter for local costs and 8% for 1983, 7.5% for 1984, 7% for 1985 and 6% thereafter for the foreign cost components have been included in the cost estimates. Physical works are expected to be completed by December 1989, and maintenance contracts by equipment suppliers for the treatment plants by December 1991. Annex 6 displays the estimated annual project investments.

3.12 The project provides for 209 man-months of foreign expert services for assistance to GECEC in the revision and evaluation of bid documents, engineering studies, staff training and a study of financial policies; 830 man-months of local consultants (GECEC) for the revision of bid documents, technical studies and construction supervision. The estimated cost of these services including salaries, overhead, fees, international travel and sub-

sistence is US$1.98 million, i.e. on average US$ 9,500 per man-month for foreign experts and US$ 3,100 per man-month for local consultants.

Financing Arrangements

3.13 It is proposed that the foreign exchange cost amounting to US$68.02 million equivalent (including front-end fee) be covered by a loan from the Arab Fund of KD 5.00 million (US$17.10 million equivalent) or 25%, by a loan from the World Bank of US$30.00 million (including the front-end fee) representing 44% of the total foreign exchange cost or 20% of the total project cost and by the Government for the balance of US$20.92 million. During negotiations assurances were obtained that this balance representing 100% of the foreign exchange cost of civil works carried out by nominated Syrian contractors, will be financed by the Government as well as local costs estimated at US$82.89 million and any supplemental funds required for a timely completion of the project.

3.14 The Arab Fund loan of KD 5.00 million for the financing of the Hama treatment facilities has already been signed. The financing arrangements for the foreign exchange cost would be as follows:

Financing of Foreign Exchange of Project Components

	Government	AFESD	IBRD	Total
	US$ Million			
1. Treatment Plant - Homs				
a. Civil Works	7.50	-	-	7.50
b. Electromechanical Equipment	-	-	17.08	17.08
c. Supply of Other Equipment	-	-	5.03	5.03
2. Trunk Sewers - Homs & Hama				
a. Civil Works	7.48	-	-	7.48
b. Supply of Equipment	-	-	1.63	1.63
3. General Companies for Sewerage				
a. Buildings and Workshops (CW)	1.00	-	-	1.00
b. Supply of Equipment	-	-	0.98	0.98
c. Vehicles and O&M Equipment	-	-	1.33	1.33
4. Technical Assistance and Consulting - Homs & Hama				
a. Technical Assistance & Consulting	-	-	2.06	2.06
5. Training - Homs & Hama				
a. Training	-	-	1.82	1.82

	Government	AFESD	IBRD	Total
	------- US$ Million -------			
6. Treatment Plant - Hama				
a. Civil Works	4.94	-	-	4.94
b. Electromechanical Equipment	-	13.05	-	13.05
c. Supply of Other Equipment	-	4.05	-	4.05
Sub-Total	20.92	17.10	29.93	67.95
7. Front-end Fee	-	-	0.07	0.07
Total	20.92	17.10	30.00	68.02
	31%	25%	44%	100%

Proposed Investment Financing Plan

3.15 The following sets out the financing plan of planned investments during the proposed project implementation period 1984-1991:

Fund Required	Homs	Hama	Total SE	Total US$	%
	-- SE Million--		---- million ---		
Proposed Capital Investment	378.62	272.22	650.84	150.89	94.4
Capitalized Interest	13.97	6.64	20.61	4.78	3.0
Working Capital	12.36	5.64	18.00	4.17	2.6
Total Requirements	404.95	284.50	689.45	159.84	100.0
Sources of Funds					
Internal Cash Generation	88.07	53.04	141.11	32.71	20.4
Less: Debt Service	54.22	31.34	85.56	19.83	(12.4
Net Internal Cash Generation	33.85	21.70	55.55	12.88	8.0
Proposed Bank Loan	115.66	13.67	129.33	30.00	18.8
Proposed AFESD Loan	-	76.17	76.17	17.10	11.0
Government Equity	255.44	172.96	428.40	99.86	62.2
Total Sources of Funds	404.95	284.50	689.45	159.84	100.0

The net internal cash generated by the General Companies for Sewerage (GECOS) in Homs and Hama would cover about 8% of the total financing. The Government would provide about 62% of the total project financing (63% in Homs and 61% in Hama). The loan of the Arab Fund for Economic and Social Development (AFESD) of US$17.1 million and the proposed Bank loan of US$30.0 million, including US$0.07 million for the front-end fee which the Government has requested

the Bank to finance, would cover the foreign exchange financing requirements of the components described in para. 3.14.

3.16 The proposed Bank loan would be made to the Government, which would on-lend US$28.7 million to the GECOS of Homs and Hama, upon their establishment foreseen by July 1, 1986 (para. 4.08), for a term of 15 years including 2 years of grace with the same interest and other charges as the Bank loan for their respective amounts of US$26.0 million and US$2.7 million equivalent. The balance of the proposed loan of US$1.30 million will be used by the Government to finance the training of instructors at the training center of the Damascus Water Supply Authority (EPEF). This center specializes in electromechanical techniques applied to the water and sewerage sector and will receive trainees from Homs and Hama. The AFESD loan already made to the Government will be on-lend to the GECOS of Hama for a term of 16 years including 2 years of grace at the same interest rate. Assurances were received during negotiations that the Government will enter subsidiary Loan Agreements with both GECOS as soon as they are established on terms and conditions acceptable to the Bank.

Project Implementation

3.17 The overall responsibility for project implementation will be entrusted to the Ministry of Housing and Utilities (MHU). MHU has already assigned a qualified engineer as project manager. MHU has also requested the General Company for Engineering and Consulting (GECEC) of Syria, a state-owned company, to provide assistance in tendering, procurement, bid evaluation, construction supervision, preparation of project's accounts and other studies as needed. This firm, staffed with a number of foreign experts, is well qualified for carrying out the engineering works required by the project at a reasonable cost. It has already undertaken satisfactorily similar assignments for the Government in the sector particularly in Damascus, Aleppo and Lattakia. Furthermore, the consultants will be reinforced by selected individual experts familiar with ICB procedures and with treatment plant technology. The contract between the Government and GECEC was reviewed and found acceptable by the Bank and was signed on March 22, 1984 before start of negotiations.

3.18 The civil works for both treatment plants and for the trunk sewers would be executed by the General Company for Water Project (GECOP). This arrangement is in line with the Government's policy that all civil works for government projects be carried out by state-owned construction companies set up for this purpose in the mid-70s. State construction companies have considerable authority and resources. This company has proved in the past, particularly in a water distribution project in Damascus, its ability to carry out quality works in the water sector with due diligence and within reasonable contractual costs. Civil works contracts for the treatment plants, the trunk sewers and office accommodations would be entirely financed by the Government. Supply and erection of equipment for the treatment plants, supply of other equipment for trunk sewers and office accommodations, and supplies of vehicles and equipment for the GECOS will be awarded following ICB procedures (para. 3.23).

3.19 It is estimated that the overall construction would be completed by December 1989. The Implementation Schedule, Annex 7, shows that after com-

pletion, the plants will be maintained by the equipment suppliers for a period of two years. No adverse environmental impact is expected from the project (para. 6.01).

3.20 Land will have to be obtained for both treatment plants. This land, near the end of the existing main sewer's outfall in each town, is presently being farmed by its private owners. No residential buildings exist at the proposed plant sites. Under prevailing procedures, such land can be purchased at negotiated prices or expropriated by the Government. Syrian officials foresee no unusual difficulties in acquiring this land. During negotiations, assurances were obtained that the Government will take all actions to acquire all such land and rights in respect of land for the construction of treatment plants and sewers.

3.21 Upon completion of the proposed works, MHU will transfer the related infrastructures to the sewerage companies for sewerage instituted in Homs and in Hama (para. 4.01). The technical staff of both companies will require considerable assistance, particularly at the outset, to become proficient in operating and maintaining the networks and the plants. Provision is made for the implementation of a detailed training program (para. 4.08). The treatment plant's equipment suppliers will provide guidance on specific operations during the plants commissioning and a two years maintenance period. A special situation prevails in Homs, where industrial wastes from the sugar refinery will reach the plant separately from the town's main sewer. The treatment plant is designed to handle these two sewage streams separately or mixed together. The optimum operation would be best determined by experience. Assurances were received during negotiations that engineering consultants assisted by equipment suppliers to analyze the quality of effluent obtained from the combined or separate treatment of domestic and industrial waste of the Homs sugar factory and to prepare quarterly reports on their recommendations, including a final report to be issued within 12 months of the initial operation of the Homs treatment plant. Agreement was also reached with the Government that the GECOS would maintain the following records in each treatment plant:

On a daily basis:

- minimum, average, and maximum flow through treatment plant
- BOD concentration of raw and treated sewage
- SS and TS concentration of raw and treated sewage
- Chlorine dose of effluent

On a monthly basis:

- DO levels of Assi River near treatment plants outlet
- Energy consumption in KWH
- Bacteriological analysis of effluent of each treatment plant (MPN of coliforms)

Procurement

3.22 The procurement arrangements for various project's components are shown in the Table below:

PROCUREMENT ARRANGEMENT FOR PROJECT COMPONENTS
(US$ Million)

PROJECT COMPONENTS	PROCUREMENT METHOD ICB	LCB	OTHER	N/A	TOTAL COST
Homs Treatment Plant					
Civil Works	-	-	-	23.32	23.32
Supply & Installation of Equipment	31.79	-	-	-	31.79
	(22.11)	-	-	-	(22.11)
Homs & Hama Trunk Sewers					
Civil Works	-	-	-	32.54	32.54
Supply of Equipment	1.96	-	-	-	1.96
	(1.63)	-	-	-	(1.63)
General Companies for Sewerage					
Buildings and Workshops	-	-	-	4.48	4.48
Supply of Equipment	1.18	-	-	-	1.18
	(0.98)	-	-	-	(0.98)
Vehicles and O&M Equipment	1.71	-	-	-	1.71
	(1.33)	-	-	-	(1.33)
Technical Asst. & Consulting					
Consulting and Supervision	-	-	-	3.67	3.67
Technical Assistance	-	-	2.74	-	2.74
			(2.06)		(2.06)
Training - Homs & Hama					
Training of Instructors	-	-	1.30	-	1.30
	-	-	(1.02)	-	(1.02)
Training of Personnel	-	-	1.09	-	1.09
			(0.80)	-	(0.80)
Hama Treatment Plant					
Civil Works	-	-	-	17.66	17.66
Supply & Installation of Equipment	-		24.46	-	24.46
Total	36.64		29.59	81.67	147.90
	(26.05)		(3.88)		(29.93)

Note: Figures in parenthesis are the respective amounts financed by the Bank.
OTHER: Procurement of services in accordance with Bank guidelines.
N/A: Executed by GECOP and financed by the Government.

In accordance with Government's policy to negotiate and award civil works contracts for government projects to state-owned construction companies (para. 3.18), all civil works for the treatment plants, trunk sewers and offices accommodations would be executed by GECOP, the designated contractor, and therefore would not be financed by the Bank. Civil works contract for treatment plants, trunk sewers and for offices' accommodations amount to an estimated US$78.0 million in the aggregate representing about 52% of the total project cost.

3.23 The civil works contract for the Homs treatment plant ($23.32 million), the trunk sewers ($32.54 million), and office accommodations in Homs and Hama ($4.48 million) representing in the aggregate US$60.34 million, and the civil works contract for the Hama treatment plant amounting to US$17.66 million, will be awarded directly to the General Company for Water Projects (GECOP), which has been selected by the Government. Therefore, in this case there will not be any financing by the Bank. The contract for the supply and erection of equipment for the Homs treatment plant estimated to total US$31.79 million equivalent will be awarded on the basis of International Competitive Bidding (ICB) in accordance with the Bank's procurement guidelines. This contract will include the supply of mechanical and electrical equipment, equipment such as pipes, valves, cast iron parts and the special sulfate resistant cement and high yielding and other reinforcement steel not manufactured in Syria. The contracts for the supply and erection of equipment for the Hama treatment plant amounting to US$24.46 million will be awarded under the same ICB procedures but in accordance with the Arab Fund guidelines. The supply contracts for equipment, such as, cast iron parts, manhole covers, steel ladders, etc. ($1.96 million), to be incorporated in the trunk sewers and for equipment such as electrical lighting, fittings, pipes, etc. ($1.18 million) for the buildings and workshops, will be awarded on the basis of ICB. The contracts for the supply of vehicles and O&M equipment estimated to total US$1.71 million will be awarded under the same procedures. The Hama treatment plant supply and erection of equipment contracts amounting to US$24.46 million will be awarded under the same ICB procedures but in accordance with the Arab Fund procurement guidelines. For bid evaluation purposes a 15% margin of preference or an amount equal to the customs duties, whichever is lower, would be applied in the case of equipment manufactured in the Syrian Arab Republic. All equipment contracts, vehicles and operation and maintenance equipment contracts will be grouped as far as practicable in order to encourage international competition. For this type of contracts, a minimum individual grouping of US$100,000 would be retained. Foreign experts for engineering and financial and management studies would be engaged in accordance with Bank's guidelines for the use of consultants by World Bank Borrowers.

3.24 Foreign contractors are expected to win all contracts for the supply of equipment. Because the local electrical and mechanical industry is reasonably developed, local companies may seek partnership with foreign firms for installation of equipment.

3.25 Technical ministries are responsible for all procurement related activities. Cumbersome administrative procedures, shortage of skilled staff and scattering of responsibilities create bottlenecks and delays in the procurement process when carried out by the ministries. In the case of the

Damascus and Aleppo Projects, project committees in each Water Supply Company, exempted from compliance with standard Government administrative channelling, have been established by Presidential Decree to expedite the implementation of the projects. GECEC which has in the past efficiently contributed to a number of such project committees will, on behalf of MHU, be responsible for carrying out procurement of all equipment and materials. Furthermore, GECEC will receive assistance through individual foreign experts familiar with ICB procedures and with treatment plant technology. A project unit will be established within MHU not later than September 30, 1984 to supervise all project implementation related activities, including procurement carried out by GECEC. The project unit will keep project accounts, which will be audited by auditors acceptable to the Bank and sent to the Bank not later than nine months after the end of each fiscal year. Assurances were also obtained that all civil works will be subject to supervision by MHU assisted by GECEC.

Disbursements

3.26 The Proposed Bank Loan of US$30.0 million would be disbursed as follows:

Category	Description	Amount US$ million	% of Expenditures To be Financed
1	Supply of mechanical and electrical equipment for Homs treatment plant, and O&M equipment	13.47	100% of foreign expenditures
2	Supply of equipment for civil works of the Homs treatment plant, and for Homs and Hama trunk sewers, office buildings, and workshops	6.88	100% of foreign expenditures
3	Installation of Electrical & Mechanical Equipment	1.38	30% of total expenditures
4	Supplier's Contract for Operation and Maintenance of Homs Treatment Plant	1.74	70% of total expenditures
5	Technical assistance	1.85	100% of foreign expenditures
6	Training	1.64	75% of total expenditures
7	Unallocated	2.97	-
8	Front-end Fee	0.07	Amount due
	Total	30.00	

3.27 Disbursements are expected to be completed twelve months after project completion, hence the Closing Date of the proposed loan would be December 31, 1992. The estimated schedule of disbursements is as follows:

Bank's Fiscal Years and Semester	Loan Disbursements Per Semester	Loan Disbursements Cumulative	%
	(US$ million)		
FY1985			
1st Semester	0.16 1/	0.16	-
2nd Semester	0.45	0.61	2
FY1986			
1st Semester	0.93	1.54	5
2nd Semester	1.49	3.03	10
FY1987			
1st Semester	2.12	5.15	17
2nd Semester	2.55	7.70	26
FY1988			
1st Semester	2.85	10.55	35
2nd Semester	2.90	13.45	45
FY1989			
1st Semester	2.87	16.32	54
2nd Semester	2.73	19.05	64
FY1990			
1st Semester	2.45	21.50	72
2nd Semester	2.16	23.66	79
FY1991			
1st Semester	1.86	25.52	85
2nd Semester	1.52	27.04	90
FY1992			
1st Semester	1.23	28.27	94
2nd Semester	0.98	29.25	98
FY1993			
1st Semester	0.75	30.00	100

1/ Includes front-end fee US$75,000.

3.28 Disbursement profiles show that disbursements for the water supply and sewerage sector in the EMENA region have extended over an eight years period, while the overall disbursement for the Syrian Arab Republic has extended over eight and a half years. It is expected that the proposed Bank Loan would be fully disbursed according to the Syrian profile of eight and a half years.

Monitoring Criteria

3.29 A number of key indicators will be used to evaluate sewerage authorities' performance and to complement the normal reporting procedures. The key indicators are listed in Annex 8. During negotiations, these indicators and the project implementation schedule (Annex 7) were discussed and agreed upon with the Government. These monitoring criteria will serve as targets for the GECOS. Assurances were obtained during negotiations that both the GECOS in Homs and Hama will report quarterly on all aspects of project work including the key indicators and the project implementation schedule. Furthermore, each GECOS will comment on any deviations from agreed targets and will as necessary take prompt remedial action in consultation with the Bank.

3.30 Assurances have also been obtained that within six months following the Closing Date of the proposed loan, MHU with the assistance of the GECOS will prepare and submit to the Bank a combined project completion report reviewing the planned objectives and the achievements of the project, including the costs and benefits derived and the performance and contribution of all parties associated with project execution and systems operation.

IV. THE BENEFICIARY

4.01 The Government will be the borrower of the proposed loan of US$30.0 million. The proposed works and related infrastructures will be transferred to the General Companies for Sewerage (GECOS) to be established in Homs and Hama upon their completion (paras. 3.16 and 4.08).

Present Organization

4.02 At present, the responsibility for the construction and operation of the sewerage networks in Homs and Hama is undertaken by the Technical Divisions of the respective municipalities. These Divisions are also responsible for construction and maintenance of roads, buildings, parks and garbage collection. There are no special sewerage sections within the Technical Divisions and staff are allocated to this function as and when required. The general administration, personnel function and accounting are handled by the municipalities' Administration and Finance Departments. Accounts are maintained in accordance with the municipal accounting code of Syria. No attempt is made to apportion labor and overhead costs of the various services provided. Therefore, it is not possible to obtain reliable costs for the operation of existing sewer systems. The actual limited operating costs incurred for sewerage services are covered by the municipalities general revenues, and funds for system expansion and capital expenditures provided by Government grants are written off each year.

4.03 The present administrative and financial management of the sewerage systems in Homs and Hama is unsatisfactory. In particular, specialized staff are not assigned responsibility for operation, adequate resources are not available, the accounting and revenue position is grossly inadequate and management and engineering staff do not assign the necessary priority to the system. Two of the major reasons for the present problems are the lack of financial resources of the municipalities and the inadequate salary structure of the local Government system in Syria, which makes it extremely difficult for municipalities to recruit and retain qualified staff.

Proposed Organization

4.04 Management consultants (Peat, Marwick & Mitchell; USA) recruited in 1976 under the First Damascus Water Supply Project (Credit 401-SYR) reviewed the present organizational structure in the sewerage sector in Homs and Hama, as well as Damascus. Five organization options were considered:

(i) creation of special sewerage departments within the three municipalities;

(ii) three separate single-purpose sewerage authorities;

(iii) three combined water and sewerage authorities;

(iv) a national sewerage authority with local branches; and

(v) regional sewerage authorities.

4.05 The consultants recommended in 1978 the establishment of regional single purpose sewerage authorities; one for the Assi River Basin to serve jointly the cities of Homs and Hama, one for the Barada River Basin to cover the Damascus area and four other regional authorities to cover the remainder of the country based on natural drainage areas. The consultants' proposal had the advantage of establishing reasonably sized sewerage companies which could phase over a period of time the extension of their activities to other centers in their respective areas. The Government, however, expressed the view that establishment of regional companies based on river basins would create in particular the risk of having the few existing technical staff in each governorate not acquainted with local conditions prevailing in the various river basins located outside of their governorate. Furthermore, such companies would not be based on the present administrative and political boundaries. The Government preferred the creation of public establishments for water supply and sewerage in each governorate. Subordinated to each Public Establishment would be two semi-autonomous General Companies: one for water supply and one for sewerage (GECOS). Each Public Establishment within a Governorate would entrust its executive powers for operation and maintenance to General Companies. Through this structure the Establishments and the Companies would be able to benefit from cooperation and coordination with existing local water supply companies, particularly for billing, customer files management, and accounting procedures. Each GECOS would be chaired by a General Director and would receive appropriate authority (staffing, equipment and operating budget) to operate effectively.

4.06 The legislative provisions governing the management and operation of public sector institutions in Syria are set out in Legislative Decree No. 18 of 1974. This Decree provides, inter alia, for:

(i) drawing up local policies under the supervision of the Ministry of Housing and Utilities;

(ii) providing for the transfer of the existing assets to new Companies in agreement with the municipalities;

(iii) entering into Loan Agreements with the State or financial and banking establishments, local or foreign, without prejudice to the rights of the State Planning Authority in virtue of the regulations in force; and

(iv) proposing by-laws to be promulgated by decree relating to financial policies, accounting and procurement.

Existing establishments for water supply have been set up in accordance with the provisions of this Decree. The sewerage companies (GECOS) will be set up in the same way and will operate on a commercial basis. In order to create a Public Establishment for water supply and sewerage in each Governorate under the Chairmanship of the Governor, the Government has prepared a draft legislative decree. This decree has already been reviewed and agreed upon by all ministerial departments concerned, by the conference of Mayors and by the Prime Minister. The draft Legislative decree allows for the establishment of the general companies (GECOS). The latter is effected by Presidential Decree and does not require ratification.

4.07. The enactment of the draft Legislative Decree which creates public establishments for water supply and sewerage in each governorate and which allows for the establishment by Presidential Decree of subsidiary companies for sewerage and water supply is a condition of effectiveness of the proposed Bank Loan.

4.08 It is not expected that the GECOS would be able to recruit many suitable staff from the municipalities, so the companies will have to be established from scratch. This could be an advantage, as it might enable the GECOS to break away from some of the traditional ineffective administrative practices in the sector. In these circumstances, a proper plan and training program is vital for the successful establishment of the companies as effective organizations (Document C2, Project File). In 1983, the Arab Fund provided financial assistance for a Water Supply and Sewerage Training Center in Syria. The Syrian Government has agreed to make the necessary land and buildings available, and the French Government has financed and carried out a feasibility study for the establishment of a training center, including a manpower survey. Supplemental funds are included in the proposed Bank loan to provide project related training for the GECOS staff in Homs and Hama. Assurances were obtained during negotiations that the GECOS of Homs and of Hama would be established by July 1, 1986. Assurances were also obtained that the transfer of ownership and management of all existing networks in the respective cities would be carried out by July 1, 1986. To put in place the basic structure of both GECOS in Homs and in Hama, a calendar of the key actions to be undertaken by both GECOS and MHU has been established (Annex 9). During negotiations, the implementation schedule of these actions was discussed and agreed upon.

In particular, the following target dates were agreed upon:

(i) nomination of the General Director of each sewerage company not later than July 1, 1985;

(ii) start of recruitment of operating personnel and implementation of the training program by July 1, 1985; and

(iii) engagement by January 1, 1986 of management and accounting consultants to assist in establishing the organization and the implementation of administrative procedures and commercial accounting system.

Billing and Collection

4.09 Surcharge on water for sewerage services will be billed by the existing water authorities. All households connected to the public system are metered. The water authorities have experienced some difficulties in billing, since a stepped tariff was introduced in late 1977. However, bills are produced since early 1983 by computer in both water authorities. Customer files are also maintained on the same equipment and accounting is being computerized. Water authorities expect to clear the present backlog in billing during the next two years. The authorities estimate that the necessary system for surcharging water could be introduced within three months. The GECOS would bill directly the limited number of industries, including the Sugar Company, not connected to the public water system.

Accounting, Audit and Insurance

4.10 The Water Supply Authorities in Syria maintain their accounts on a commercial basis in accordance with a standardized Government format. This system is satisfactory and there should be no difficulties for the GECOS to adopt a similar system. During negotiations, agreement was reached that the GECOS will implement, as soon as established, a commercial accounting system, that their annual accounts will be audited by independent auditors acceptable to the Bank and that the annual accounts and audit report will be submitted to the Bank within nine months of the end of each fiscal year. Assurances were also obtained that the GECOS will take out and maintain insurance coverage in accordance with normal public utility practice.

V. FINANCIAL ANALYSIS

Past Results and Present Situation

5.01 The present sewer networks in the cities of Homs and Hama are constructed, operated and maintained by the municipalities. These systems are regarded as one of the range of services provided by the municipalities and no separate accounts or asset inventories are maintained. Capital funds are provided by the Central Government and day-to-day operating and maintenance expenditures are financed from the general revenue of the municipalities.

5.02 The total revenue of the Homs and Hama Municipalities in 1982 was S£ 77.46 million and S£ 93.54 million respectively. These revenues accrued from three main sources: revenues collected directly by the Municipalities (19%); allocation of certain taxes collected by the Government (9%); and grants from the Government (72%). The principal source of directly collected revenues is derived from the sale of land which is acquired in excess of need for road construction and housing development and sold after the schemes are completed. In 1982 this source provided 45% of Homs' income and 35% for Hama's. Included in these revenues, is a small income specifically related to sewerage which consists of a charge levied on the owners of property when a sewer is provided or reconstructed. The charge is set at S£ 0.60/m2 (S£ 0.30 when a sewer is reconstructed) of floor area for all properties which can be connected to the sewer. This charge generates about S£ 1.24 million per annum for Homs and S£ 0.56 million for Hama.

5.03 The expenditure of the municipalities in 1982, on wages and administration, accounted for about 40% of their budget and the balance was invested in construction of roads, buildings, parks and sewers. The municipalities prepared a breakdown of the expenditure on sewerage for the last three years 1980-1982 as follows:

	Homs			Hama		
	1980	1981	1982	1980	1981	1982
	S£ 000					
Maintenance	0.40	1.00	1.09	0.40	0.90	1.18
Construction	1.10	2.44	3.11	0.70	2.18	1.56
Total	1.50	3.44	4.20	1.10	3.08	2.74

The municipalities do not operate cost accounting systems and it is most unlikely that all the expenditure on maintenance, particularly the labor and overhead costs, is included in the above figures.

Financing Policies and Objectives

5.04 One of the objectives of the Bank's involvement in the sewerage sector is to establish financial policies and implement cost recovery from users by the introduction of a progressive tariff structure and other direct

sources of income to provide revenue for the operation and development of the system and thereby reduce the burden on municipal and Government resources. The issue of financial policies to be applied in the sector has been raised since 1978. Only recently (June 1983), has the Government accepted in principle a recovery of at least all operating costs including depreciation. Depreciation is expected to remain higher in any given year than projected debt service to be charged to the GECOS when works are in operation. In order to determine the most appropriate way for achieving this financial objective, the Government has agreed to commission a financial study about 15 months before the GECOS take over responsibility for sewerage services, i.e., March 1985. The objective of this study is to assess the optimum manner to generate and collect revenues that would amount to a level at least equal to operation and maintenance costs plus depreciation.

5.05 The Government confirmed during negotiations that a financial study will be commissioned not later than March 1985 and that its recommendations will be sent to the Bank for comments. Furthermore, the calendar of main project actions (para. 4.08) agreed upon during negotiations shows the target date for completion of the financial study to be carried out by GECEC as December 31, 1985. It was also agreed that the sewerage companies would implement, not later than July 1, 1986, the financial measures proposed on the basis of the study. The Government will take into account the view of the Bank in the formulation of such measures.

Financing Plan of GECOS' Investment Program

5.06 The GECOS Sources and Applications of Funds Statements appear in Annexes 13 and 14. Those for the project implementation period (1984-1991) may be summarized as follows:

Fund Required	GECOS Homs	GECOS Hama	Total SL	Total US$	%
	-- SL Million--		---- million ---		
Proposed Capital Investment	378.62	272.22	650.84	150.89	74
Capitalized Interest	13.97	6.64	20.61	4.78	2
Other Capital Expenditures	140.16	45.77	185.93	43.10	21
Working Capital	14.72	6.21	20.93	4.85	3
Total Requirements	547.47	330.84	878.31	203.62	100
Sources of Funds					
Internal Cash Generation	104.84	58.30	163.14	37.82	19
Less: Debt Service	54.22	31.34	85.56	19.83	(10)
Net Internal Cash Generation	50.62	26.96	77.58	17.99	9
Proposed Bank Loan	115.66	13.67	129.33	30.00	15
Existing AFESD Loan	-	76.17	76.17	17.10	9
Government Equity	381.19	214.04	595.23	138.53	67
Total Sources of Funds	547.47	330.84	878.31	203.62	100

5.07 During the project implementation period, the net internal cash generation would provide on average for both GECOS about 9% of total financing requirements, Government contributions 67%, the existing Arab Fund loan 9% and the proposed Bank loan 15%. Debt charges would be charged to the GECOS of Homs and Hama by the time of the treatment works completion, i.e., 1989 for Homs and 1990 for Hama, in addition to the operating costs of the new facilities. Before that time, the only recurrent costs of the sewerage authorities would be those related to operating and maintaining the existing facilities, including depreciation, with interest during construction on the IBRD and AFESD loans amounting to US$4.78 million to be paid by the Government, as part of its equity contribution. This financing plan supports the Government financial policy principle (para. 5.04). The Government envisages obtaining a substantial financial contribution (about one-third of total treatment plant cost) from the Homs sugar factory, which would otherwise have to construct separate treatment facilities at a higher cost. The form of this contribution whether in capital or in special sewerage charges or both would be determined in the financial study.

Future Financial Performance

5.08 Forecast financial statements appear in Annexes 10 and 11. Financial assumptions are presented in Annex 12. The investment plan (1989-1993) discussed with MHU assumes investments other than the proposed project on the order of S£143.93 million for Homs and S£51.37 million for Hama, in current value. This objective is realistic and aims at maintaining the service level in both municipalities and expanding the treatment facilities when they reach their optimum capacity.

5.09 Projections of the GECOS revenues have been assessed according to the financial policy principle set by the Government (para. 5.04). Projected debt service to be charged to the sewerage authorities when treatment facilities are in operation would remain constantly lower than depreciation over the foreseeable future. From 1987 [1/] to the end of the project implementation period (1990 in Homs and 1991 in Hama), the GECOS revenues are expected to grow
about 3.9 times in Homs and 4.3 times in Hama from S£ 13.3 million and S£ 7.5 million to S£ 52.1 million and S£ 31.9 million respectively. During the same period their operating expenses before depreciation would grow from S£ 3.0 million to S£ 25.9 million in Homs and from S£ 2.0 million to S£ 13.9 million in Hama, leaving gross margins sufficient to cover all their projected debt service and an average of 9% of investment costs. Their working ratio would remain below 50%. In Homs total fixed assets in operation would increase from S£ 391.3 million to S£ 734.5 million, i.e., about 1.9 times, while in Hama, they would grow from S£ 203.6 million to S£ 464.0 million, i.e., about 2.3 times. The debt equity ratio would stay around 11:89 in Homs and 16:84 in Hama. The debt service coverage ratio would not drop below 1.5.

1/ Both GECOS are expected to start operating their respective sewerage facilities by mid 1986 and therefore this year cannot be taken as a valid basis for revenues comparison.

VI. JUSTIFICATION

Health Benefits and Environmental Impact

6.01 One of the main objectives of the project is to enhance health and environmental conditions in the area by providing adequate sewage treatment. The project thus would provide a first opportunity in Syria to address issues of widespread environmental deterioration that have profound long-run economic consequences. In particular, present health hazards caused by the discharge of effluents directly into the bed of the Assi river which flows through both cities, will be eliminated. Removal of effluents from the river bed, particularly during the dry season when the flow of the river is at a minimum, will also remove the threat of contamination of lower aquifers which are found below the city of Homs and are used for human consumption. The treatment of sewage will provide safer water for irrigation and eliminate the present dangerous practice of irrigating vegetable gardens with raw sewage or heavily polluted water from the river. This would lessen the greatest sources of contamination and infection and is expected to reduce significantly the morbidity and mortality of the population living in the project area. Sewage treatment will also contribute to the restoration of the fishing industry in the Assi river.

6.02 No adverse environmental impact is expected from the project. The treatment plant sites are located several kilometers downstream from both towns and the closest rural settlements are situated 0.6 km from the plant sites. Under normal operation of the treatment plants, little or no odor and no noise nuisance should affect these settlements which are located windward of the plants. Furthermore no urban zoning will be permitted within a 0.5 km radius from the plant sites. Sludges from the treatment process will be dried, stabilized and stored during such period as to ensure that they are pathogenic free before being provided to farmers for disposal on agricultural land as soil conditioner.

Least-Cost Solution

6.03 Alternative treatment processes considered for least-cost comparisons include conventional activated sludge, biological filtration, extended aeration, aerated lagoons, and waste stabilization ponds (Document C1 of the Project File).

6.04 In Homs and Hama, the sites for the proposed plants are adjacent to existing sewer main outfalls beside the river, in accordance with earlier sewerage master plans. Land at each of these sites is limited and could accommodate conventional treatment plants, but would be inadequate for waste stabilization ponds. The only feasible sites for ponds in each town are several kilometers away from the existing outfalls and would require pumping stations plus pipelines. This additional equipment is not necessary at the more restricted sites by the river. The combination of capital and operating costs make pond alternatives more expensive than conventional plants to be constructed in the vicinity of both towns.

6.05 For Homs and Hama, the recommended alternative for sewage treatment is to construct conventional plants which include disinfection of effluents. This provides the least-cost solution for achieving a high degree of pathogenic destruction and improving the potential use of the river for irrigation.

6.06 The proposed extension of trunk sewers to serve the low-income settlements also is the least-cost solution to the disposal and treatment needs of these settlements, due to their high population density and their proximity to existing trunk sewers.

Beneficiaries

6.07 The proposed project will benefit the present and future population of Homs and Hama although at different levels. The treatment and reuse of the effluents of an estimated 750,000 inhabitants living in the project area by the year 1990 and of the industries representing an additional 0.90 million inhabitant equivalent, will have a major health environmental and economic impact. The residents along the river are mostly affected by the noxious conditions prevailing at present as a result of the discharge of raw sewage. The elimination of these discharges and the improved water quality of the river as a result of the sewage treatment will provide a better environment to the presently connected 120,000 inhabitants living along the river. Finally the 1984-1990 trunk sewers expansion program will give 148,000 inhabitants access to community sewer systems.

Affordability

6.08 The average water consumption of the low-income group is 10 m^3 per month per household of 6.2 persons on average. Assuming that the income of this segment of population is the minimum wage paid to the employees of the public sector (SE 567 per month) where employment is freely available, the total monthly payment for sewerage in 1990 would be SE 9.4 or about 1.7% of minimum monthly income in Hama, and SE 7.5 or about 1.3% of minimum monthly income in Homs. This is considered to be affordable. Future sewerage charges adjustments should not change this forecast, since no increases in real terms are expected for low-income consumers. The combined monthly payment for water and sewerage will amount about SE 13.9 in Hama and SE 12.0 in Homs or 2.5% and 2.1%, respectively, of the minimum wage, which is also considered affordable.

Adequacy of Revenues

6.09 The long-run incremental cost of providing sewerage services in Homs and Hama is estimated at SE0.694/m^3 in 1983 prices, at a 10% discount rate which is considered appropriate for Syria. It is also estimated that once both treatment plants are commissioned, the revenues generated from sewerage operations will reach SE0.800/m^3 in 1983 prices (SE0.747/m^3 in Homs and SE0.928/m^3 in Hama). The fact that these revenues per cubic meter approximate the long run average incremental cost of providing sewerage services indicates that their level would be appropriate.

Risks and Safeguards

6.10 The risks confronting the project are two-fold, those arising from the fact that the GECOS are being newly established and those associated with pro- ject and country considerations. Both of these risks could result in delays in project implementation and consequent escalation of costs. Experience with previous projects in the sector is useful but may not be completely reliable because of the newness of the GECOS and the nature of the project. It will be the first plants to be built in Syria for urban and industrial sewage treatment. This will introduce some risk due to the relative inexperience in the country with treatment facilities of this size. However, the measures recommended in this report, such as (i) the technical assistance provided by foreign experts for bid evaluation, construction and supervision; (ii) experts to assist in the development and implementation of the technical, managerial and accounting organization of the new authorities; (iii) implementation of a vigorous train- ing program complemented by a two years maintenance contract of the treatment plants equipment suppliers; (iv) study and adoption of financial policies aimed at building the financial viability of the GECOS; and (v) Bank's monitoring of key performance indicators for the GECOS and providing necessary guidance during supervision, should help to minimize the project risks.

VII. AGREEMENTS REACHED AND RECOMMENDATIONS

7.01 The enactment of the draft Legislative Decree allowing for the establishment of separate general companies for water supply and sewerage under a public establishment in each governorate on the same commercial basis as provided by Decree No. 18 of 1974 would be a condition of effectiveness of the proposed Bank loan (para. 4.07).

7.02 Agreements having been reached on the issues referred to in Chapter III to V, and subject to the condition of effectiveness set forth in para 4.07, the proposed project is suitable for a Bank loan of US$30.0 million to the Government of the Syrian Arab Republic for a term of 17 years, including 4 years of grace at the standard variable interest rate.

SYRIAN ARAB REPUBLIC

ANNEX 1

HOMS & HAMA SEWERAGE PROJECT

POPULATION PROJECTIONS

Year	Homs		Hama	
	Population (000)	Annual Growth Rate (% pa)	Population (000)	Annual Growth Rate (% pa)
1980	215	-	138	-
	-	4.5	-	4.1
1981	349	-	214	-
	-	4.2	-	0.2
1983	379	-	215	-
	-	4.0	-	2.7
1988	462	-	246	-
	-	3.8	-	2.7
1993	556	-	281	-
	-	3.6	-	2.4
1998	664	-	316	-
	-	3.4	-	2.1
2003	784	-	350	-
	-	3.1	-	2.0
2008	915	-	387	-

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

HOMS - PROJECTIONS OF WATER DEMAND

	PUBLIC WATER SUPPLY								PRIVATE SUPPLIES			TOTAL WATER SUPPLY	
	Population Served by Connections		Domestic & Commercial Connections		Public Establishments	Other Public Uses, Mosques & Standpipes	Industry	Total Public	Sugar Factory	Other Industries	Total Private		
Year	% of Total	Number (000)	Per Capita (l/c/d)	000 m3/ year	000 m3 per year							000 m3/ year	m3/ sec
1981	84	293	154	16,470	1,758	440	820	19,488	7,700	1,744	9,444	28,932	0.92
1982	84	305	154	17,144	1,854	424	878	20,469	7,700	1,800	9,500	29,800	0.95
1983	85	322	155	18,217	1,955	490	915	21,577	7,700	1,860	9,560	31,137	0.99
1988	87	402	163	23,920	2,550	680	1,180	28,330	7,700	2,180	9,880	35,210	1.21
1993	89	495	171	30,895	3,350	865	1,480	36,590	7,700	2,570	10,270	46,860	1.49
1998	91	605	180	39,750	4,250	960	1,840	46,800	7,700	3,030	10,730	57,530	1.82
2003	93	730	189	50,360	5,450	1,060	2,245	59,115	7,700	3,530	11,230	70,345	2.23
2008	95	870	199	63,190	6,550	1,160	2,745	73,645	7,700	4,090	11,790	85,435	2.71

Note: (1) Private wells, estimated to serve 19,500 inhabitants in 1981 and projected to decline so that only 10,000 inhabitants will be using wells in 2008, not included in this summary.
(2) Other public uses, mosques and standpipes are metered but not charged.

ANNEX 3

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

HAMA - PROJECTIONS OF WATER DEMAND

Year	Population Served by Connections		Domestic & Commercial Connections		Public Establishments	Other Public Uses, Mosques & Standpipes	Industry	Total	
	% of Total	Number (000)	Per Capita (l/c/d)	000 m3/year	000 m3 per year			000 m3/year	m3/sec
1981	98	210	149	11,441	116	525	418	12,500	0.40
1982	98	203	149	11,038	570	585	757	1,2950	0.41
1983	98	211	150	11,540	590	600	805	13,535	0.43
1988	98	242	158	13,960	705	660	905	16,230	0.51
1993	98	276	166	16,725	845	730	1,015	19,315	0.61
1998	98	310	175	19,800	975	805	1,145	22,725	0.72
2003	98	343	184	23,035	1,170	890	1,285	26,380	0.84
2008	98	379	194	26,840	1,400	980	1,445	30,665	0.97

Note: In 1981 and 1982 due to the unstable local situation, part of the population left Hama temporarily; in 1983 a reverse phenomenon is observed.

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

SEWAGE FLOWS IN DRY AND WET WEATHER

HOMS

Year	Population Served by Sewers % of Total	Population Served by Sewers Number (000)	Per Capita Discharge to Sewers l/c/d	Mean Dry Weather Flow Domestic (liters/second)	Mean Dry Weather Flow Industrial (liters/second)	Mean Dry Weather Flow Extraneous (liters/second)	Mean Dry Weather Flow Total (liters/second)	Wet Weather Peak Flow l/s	Ratio of Wet to Dry Weather Flows
1981	84	293	139	481	376	254	1,111	2,438	2.2
1982	84	305	140	494	383	264	1,141	2,527	2.2
1983	85	322	141	525	389	274	1,188	2,627	2.2
1988	87	402	148	688	425	333	1,446	3,247	2.2
1993	89	495	155	888	468	407	1,763	4,007	2.3
1998	91	605	162	1,134	531	499	2,164	4,963	2.3
2003	93	730	170	1,436	571	602	2,609	6,052	2.3
2008	95	870	178	1,792	641	730	3,163	7,388	2.3

HAMA

Year	Population Served by Sewers % of Total	Population Served by Sewers Number (000)	Per Capita Discharge to Sewers l/c/d	Mean Dry Weather Flow Domestic (liters/second)	Mean Dry Weather Flow Industrial (liters/second)	Mean Dry Weather Flow Extraneous (liters/second)	Mean Dry Weather Flow Total (liters/second)	Wet Weather Peak Flow l/s	Ratio of Wet to Dry Weather Flows
1981	93	199	125	287	26	63	376	976	2.6
1982	93	193	131	292	47	68	407	1,038	2.6
1983	93	200	132	305	50	71	426	1,086	2.6
1988	93	230	138	367	56	85	508	1,298	2.6
1993	93	262	145	439	63	100	602	1,543	2.6
1998	95	300	152	528	71	120	719	1,846	2.6
2003	95	333	160	616	79	139	834	2,145	2.6
2008	95	367	169	717	89	161	967	2,490	2.6

Note: Wet weather peak flows are limited by storm water overflows to the sum of:

- mean daily domestic sewage flow times peak factor of at least 3.0;
- average industrial wastewater over working day times peak factor of 2.0; and
- extraneous inflows.

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

PROJECT COSTS: HOMS

ITEM	Local	Foreign	Total	Local	Foreign	Total	% of Total
	S£ Millions			US$ Millions			
HOMS - TREATMENT PLANT							
Civil Works	45.01	21.37	66.38	11.54	5.48	17.02	32
Mech. & Electr. Equipment	18.56	45.44	64.00	4.76	11.65	16.41	71
Supply of Other Equipment	7.36	13.68	21.04	1.89	3.51	5.39	65
Land	4.80	-	4.80	1.23	-	1.23	-
HOMS - TRUNK SEWERS							
Civil Works	45.10	14.04	59.14	11.56	3.60	15.16	24
Supply of Equipment	.61	2.95	3.56	.16	.76	.91	83
GENERAL CO. FOR SEWERAGE							
Buildings & Workshops	6.71	2.00	8.71	1.72	.51	2.23	23
Vehicles, O & M Equipment	.62	2.21	2.83	.16	.57	.73	78
Supply of Equipment	.39	1.90	2.29	.10	.49	.59	83
TECHNICAL ASSISTANCE & CONSULTING							
Prep. & Review Bid Documents	.22	.39	.61	.06	.10	.16	64
Sewerage Master Plan Study	.63	.58	1.21	.16	.15	.31	48
Detailed Design Sewers	.36	.19	.55	.09	.05	.14	35
Phase II Treatment Plant	.42	.39	.81	.11	.10	.21	48
O & M, & Engineering Asst.	.47	1.42	1.89	.12	.36	.48	75
TRAINING - HOMS							
Training of Trainers	.63	1.70	2.33	.16	.44	.60	73
Training of Personnel	.40	1.43	1.83	.10	.37	.47	78
Construction Supervision	4.84	-	4.84	1.24	-	1.24	-
Base Cost (Dec. 1983 Prices)	137.13	109.69	246.82	35.16	28.12	63.28	44
Physical Contingencies	14.10	11.65	25.76	3.62	2.99	6.60	45
Price Contingencies	58.84	47.21	106.05	10.38	8.33	18.72	45
TOTAL PROJECT COST	210.07	168.56	378.63	49.16	39.44	88.60	45

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ANNEX 5
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HOMS & HAMA SEWERAGE PROJECT

PROJECT COSTS: HAMA

ITEM	Local	Foreign	Total	Local	Foreign	Total	% of Total
		S£ Millions			US$ Millions		
HAMA - TREATMENT PLANT							
Civil Works	34.11	13.26	47.37	8.74	3.40	12.15	28
Mech. & Electr. Equipment	13.41	32.83	46.24	3.44	8.41	11.85	71
Supply of Other Equipment	3.74	11.84	15.58	.96	3.04	3.99	76
Land	4.50	-	4.50	1.15	-	1.15	-
HAMA - TRUNK SEWERS							
Civil Works	23.54	7.30	30.84	6.04	1.87	7.91	24
Supply of Equipment	.31	1.55	1.86	.08	.40	.48	83
GENERAL CO. FOR SEWERAGE							
Buildings & Workshops	3.69	1.06	4.75	.95	.27	1.22	22
Vehicles, O & M Equipment	.46	1.64	2.10	.12	.42	.54	78
Supply of Equipment	.21	1.04	1.25	.05	.27	.32	83
TECHNICAL ASSISTANCE & CONSULTING							
Prep. & Review Bid Documents	.22	.39	.61	.06	.10	.16	64
Sewerage Master Plan Study	.42	.39	.81	.11	.10	.21	48
Detailed Design Sewers	.29	.19	.48	.07	.05	.12	40
Phase II Treatment Plant	.42	.39	.81	.11	.10	.21	48
O & M, & Engineering Asst.	.48	1.44	1.92	.12	.37	.49	75
TRAINING - HAMA							
Training of Trainers	.27	1.02	1.29	.07	.26	.33	73
Training of Personnel	.33	.91	1.24	.09	.23	.32	78
Construction Supervision	3.25	-	3.25	.82	-	.82	-
Base Cost (Dec. 1983 Prices)	89.65	75.25	164.90	22.98	19.29	42.27	46
Physical Contingencies	9.18	8.12	17.30	2.35	2.08	4.43	47
Price Contingencies	48.70	41.33	90.03	8.38	7.14	15.52	46
TOTAL PROJECT COST	147.53	124.70	272.23	33.71	28.51	62.22	46

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

ANNUAL PROJECT INVESTMENT - HOMS

ITEM	1984	1985	1986	1987	1988	1989	1990	TOTAL	% Foreign	Amount
	(US$ Million)									
HOMS - TREATMENT PLANT										
Civil Works	-	5.11	5.11	5.11	1.70	-	-	17.02	32	5.5
Mech. & Electr. Equipment	-	-	2.95	7.38	4.43	.82	.82	16.41	71	11.7
Supply of Other Equipment	-	1.62	1.62	1.62	.54	-	-	5.39	65	3.5
Land	1.23	-	-	-	-	-	-	1.23	-	-
HOMS - TRUNK SEWERS										
Civil Works	-	3.79	3.79	3.79	3.79	-	-	15.16	24	3.6
Supply of Equipment	-	.23	.23	.23	.23	-	-	.91	83	.8
GENERAL CO. FOR SEWERAGE										
Buildings & Workshops	-	1.47	.76	-	-	-	-	2.23	23	.5
Vehicles, O & M Equipment	-	-	.73	-	-	-	-	.73	78	.6
Supply of Equipment	-	.39	.20	-	-	-	-	.59	83	.5
TECHNICAL ASSIST.& CONSULTING										
Prep. & review Bid Docs.	.16	-	-	-	-	-	-	.16	64	.1
Sewerage Master Plan Study	-	-	.16	.16	-	-	-	.31	48	.1
Detailed Design Sewers	.07	.07	-	-	-	-	-	.14	35	.0
Phase II Treatment Plant	-	-	-	-	.21	-	-	.21	48	.1
O & M, & Engineering Assist.	-	.16	.16	.16	-	-	-	.48	75	.4
TRAINING - HOMS										
Training of Trainers	-	.12	.24	.24	-	-	-	.60	73	.4
Training of Personnel	-	.09	.19	.19	-	-	-	.47	78	.4
Construction Supervision	-	.29	.32	.38	.22	.02	.02	1.24	-	-
Base Cost (Dec. 1983 Prices)	1.46	13.34	16.45	19.25	11.12	.84	.84	63.28	44	28.1
Physical Contingencies	.15	1.41	1.73	2.01	1.14	.08	.08	6.60	45	3.0
Price Contingencies	.13	2.29	4.19	6.47	4.69	.43	.51	18.72	45	8.3
TOTAL PROJECT COST	1.73	17.04	22.37	27.73	16.95	1.35	1.43	88.60	45	39.4

SYRIAN ARAB REPUBLIC

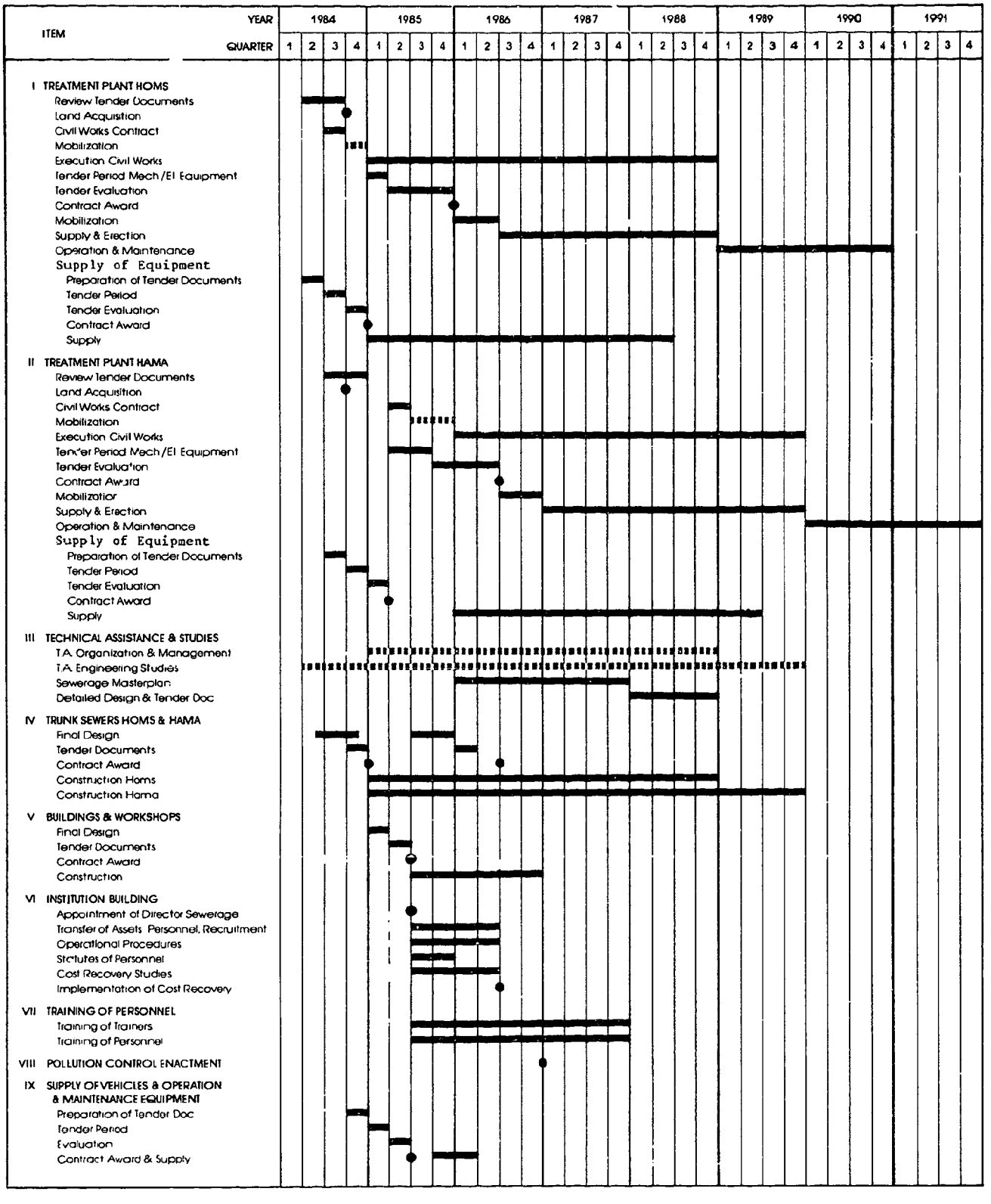
HOMS & HAMA SEWERAGE PROJECT

ANNUAL PROJECT INVESTMENT - HAMA

ITEM	1984	1985	1986	1987	1988	1989	1990	1991	TOTAL	% Foreign	Amount
	(US$ Million)										
HAMA - TREATMENT PLANT											
Civil Works	-	-	3.64	3.64	3.64	1.21	-	-	12.15	28	3.4
Mech. & Electr. Equipment	-	-	-	2.37	4.74	3.56	.59	.59	11.85	71	8.4
Supply of Other Equipment	-	-	1.20	1.20	1.20	.40	-	-	3.99	76	3.0
Land	-	1.15	-	-	-	-	-		1.15	-	-
HAMA - TRUNK SEWERS											
Civil Works	-	1.58	1.58	1.58	1.58	1.58	-	-	7.91	24	1.9
Supply of Equipment	-	.10	.10	.10	.10	.10	-	-	.48	83	.4
GENERAL CO. FOR SEWERAGE											
Buildings & Workshops	-	.80	.41	-	-	-	-	-	1.22	22	.3
Vehicles, O & M Equipment	-	-	.54	-	-	-	-	-	.54	78	.4
Supply of Equipment	-	.21	.11	-	-	-	-	-	.32	83	.3
TECHNICAL ASSIST.& CONSULTING											
Prep. & review Bid Docs.	.16	-	-	-	-	-	-	-	.16	64	.1
Sewerage Master Plan Study	-	-	.10	.10	-	-	-	-	.21	48	.1
Detailed Design Sewers	.06	.06	-	-	-	-	-	-	.12	40	.0
Phase II Treatment Plant	-	-	-	-	.21	-	-	-	.21	48	.1
O & M, & Engineering Assist.	-	-	.12	.12	.12	.12	-	-	.49	75	.4
TRAINING - HAMA											
Training of Trainers	-	-	.11	.11	.11	-	-	-	.33	73	.2
Training of Personnel	-	-	.10	.10	.11	-	-	-	.32	78	.3
Construction Supervision	-	.08	.16	.19	.23	.14	.01	.01	.82	-	-
Base Cost (Dec. 1983 Prices)	.22	3.99	8.18	9.51	12.04	7.11	.60	.60	42.27	46	19.3
Physical Contingencies	.02	.40	.88	1.01	1.27	.73	.06	.06	4.43	47	2.1
Price Contingencies	.02	.68	2.09	3.20	5.10	3.65	.36	.42	15.52	46	7.1
TOTAL PROJECT COST	.26	5.07	11.15	13.72	18.41	11.49	1.02	1.08	62.22	46	28.5

ANNEX 7

SYRIAN ARAB REPUBLIC
HOMS AND HAMA SEWERAGE PROJECT
Project Implementation Schedule



November 1983

World Bank – 25651

SYRIAN ARAB REPUBLIC

ANNEX 8

HOMS & HAMA SEWERAGE PROJECT

MONITORING CRITERIA

Each General Companies for Sewerage should make records of the following information and provide revised summaries of these data in their respective quarterly and annual reports:

	1986 1/	1987	1988	1989	1990	1991	1992	1993
HOMS								
(i) General								
Total population 10^3	427	444	462	479	498	516	536	556
Total population served 10^3	368	385	402	419	437	455	475	495
(ii) Staffing and Training								
Total staff	50	65	120	245	300	315	325	335
Man-month of staff training	36	72	72	25	30	35	35	35
(iii) System operation								
Sewage volume $10^6 m^3$/year	16.14	33.59	34.98	36.38	37.83	39.35	40.97	42.65
Number of customers 10^3	59	62	65	68	70	73	77	80
(iv) Finance								
Average revenue in S£ per m^3	0.372	0.395	0.514	1.107	1.377	1.404	1.471	1.510
Working ratio %	21	22	31	39	50	51	51	52
Debt service coverage	-	-	-	1.5	1.6	1.6	1.7	1.9
Debt equity ratio	6:94	8:92	9:91	11:89	11:89	11:89	11:89	10:90
HAMA								
(i) General								
Total population 10^3	234	240	247	254	260	267	275	282
Total population served 10^3	217	224	230	236	242	249	255	262
(ii) Staffing and Training								
Total staff	50	55	60	105	225	270	280	290
Man-month of staff training	20	35	37	30	20	25	30	30
(iii) System operation								
Sewage volume $10^6 m^3$/year	6.91	14.33	14.87	15.41	15.96	16.53	17.12	17.75
Number of customers 10^3	34	35	36	37	38	39	40	41
(iv) Finance								
Average revenue in S£ per m^3	0.518	0.521	0.592	0.809	1.712	1.927	1.932	1.986
Working ratio %	28	26	24	32	38	44	45	47
Debt service coverage	-	-	-	-	1.6	1.7	1.7	1.8
Debt equity ratio	3:97	7:93	11:89	15:85	17:83	16:84	15:85	14:86

1/ Six months of operation

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

CALENDAR OF KEY ACTIONS

WORKS - HOMS

Revision of tender documents (Treatment Plant)	April - September 1984
Sewers - detailed design	May 1984
Right of use of land	September 1984
Civil works contract for treatment plant	September 1984
Review of tender documents by IBRD	October 1984
Tendering of electromechanical equipment	December 1984
Treatment plant civil works start of const.	January 1985
Sewers - start of construction	January 1985
Electromechanical equipment tender evaluation	March - August 1985
Review of tender evaluation by IBRD	September 1985
Electromechanical equipment contract award	January 1986

WORKS - HAMA

Revision of tender documents (Treatment Plant)	April - September 1984
Sewers - detailed design	January 1985
Review of tender documents by IBRD	February 1985
Tendering of electromechanical equipment	April 1985
Right of use of land	June 1985
Civil works contract for treatment plant	June 1985
Sewers - start of construction	December 1985
Treatment plant civil works start of const.	January 1986
Electromechanical equipment tender evaluation	September 1985 - February 1986
Review of tender evaluation by IBRD	April 1986
Electromechanical equipment contract award	June 1986

INSTITUTION BUILDING (GECOS)

Financial study	March - December 85
Recruitment of General Directors	July 1985
Management study	January - March 1986
Construction of office building and workshop	June 1985 - June 1986
Tender for operational equipment & vehicles	September 1985
Tender evaluation	January 1986
Review of tender evaluation by IBRD	February 1986

Contract award for maintenance equipment	March 1986
Supply of maintenance of equipment & vehicles	June 1986
Takeover of sewerage operation	July 1986
Implementation of financial policy	July 1986
Training of personnel - network	July 1985 - December 1986
- treatment plant	June 1986 - December 1988

CONSULTING & TECHNICAL ASSISTANCE STUDIES

Sewerage master plans	January 1986 - December 1987
Detail design and tender document (Phase II)	June 1986 - June 1987

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

GECOS-HOMS-INCOME STATEMENTS

S£ MILLIONS

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
FISCAL YEAR ENDING DECEMBER 31										
TOTAL POPULATION (000)	394.00	410.00	427.00	444.00	462.00	479.00	498.00	516.00	536.00	556.00
POPULATION SEWERED (000)	337.00	352.00	368.00	385.00	402.00	419.00	437.00	455.00	475.00	495.00
WATER CONSUMPTION (MCM)										
DOMESTIC & COMMERCIAL	19.24	20.32	21.45	22.65	23.92	25.18	26.50	27.89	29.36	30.90
INDUSTRIAL	.97	1.01	1.07	1.12	1.18	1.24	1.29	1.35	1.42	1.48
PRIVATE SOURCES	9.63	9.69	9.75	9.82	9.88	9.96	10.04	10.11	10.19	10.27
OPERATING REVENUES										
WATER SURCHARGE/FEE/TAXES	-	-	5.73	12.67	17.31	39.39	50.93	53.91	58.80	62.83
OTHER INCOME	-	-	.28	.60	.66	.88	1.18	1.34	1.45	1.57
TOTAL REVENUES	-	-	6.01	13.27	17.97	40.27	52.11	55.25	60.25	64.40
OPERATING EXPENSES										
SALARIES & WAGES	-	-	.46	1.21	2.35	4.98	6.42	7.04	7.62	8.30
MATERIALS & CHEMICALS	-	-	.36	.81	1.72	5.93	10.88	11.98	12.99	14.16
ELECTRICITY	-	-	-	-	-	2.47	5.32	5.74	6.25	6.81
ADMINISTRATION	-	-	.38	.77	1.17	1.79	2.44	2.68	2.90	3.16
MISCELLANEOUS	-	-	.08	.19	.35	.68	.88	.96	1.04	1.13
SUB-TOTAL	-	-	1.28	2.98	5.59	15.85	25.94	28.40	30.80	33.56
DEPRECIATION	-	-	4.73	10.29	12.38	24.42	26.17	26.85	29.45	30.84
TOTAL OPERATING EXPENSES	-	-	6.01	13.27	17.97	40.27	52.11	55.25	60.25	64.40
NET OPERATING INCOME	-	-	-	-	-	-	-	-	-	-
INTEREST	-	-	-	-	-	7.05	7.84	8.18	8.08	7.45
NET INCOME	-	-	-	-	-	(7.05)	(7.84)	(8.18)	(8.08)	(7.45)
WORKING RATIO	-	-	21%	22%	31%	39%	50%	51%	51%	52%

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

GECOS - HOMS - FUNDS FLOW STATEMENTS

SL MILLIONS

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
FISCAL YEAR ENDING DECEMBER 31										
INTERNAL FUNDS GENERATION										
NET INTERNAL SOURCES BEFORE DEPRECIATION	-	-	4.73	10.29	12.38	24.42	26.17	26.85	29.45	30.84
OPERATING REQUIREMENTS										
INCREASE (DECREASE) IN WORKING CAPITAL	-	-	(23.53)	(3.52)	6.05	21.76	8.38	5.58	2.22	4.15
DEBT SERVICE										
INTEREST	-	-	-	-	-	7.05	7.84	8.18	8.08	7.45
AMORTIZATION	-	-	-	-	4.45	8.90	8.90	8.90	8.90	8.90
TOTAL DEBT SERVICE	-	-	-	-	4.45	15.95	16.74	17.08	16.98	16.35
TOTAL OPERATING REQUIREMENTS	-	-	(23.53)	(3.52)	10.50	37.71	25.12	22.66	19.20	20.50
NET FUNDS AVAILABLE FROM OPERATIONS	-	-	28.26	13.81	1.88	(13.29)	1.05	4.19	10.25	10.34
CONSTRUCTION REQUIREMENTS										
PROPOSED PROJECT	7.08	69.79	93.91	119.73	75.24	6.16	6.71	-	-	-
CAPITALIZED INTEREST	1.19	1.14	2.07	3.78	5.79	-	-	-	-	-
OTHER CAPITAL EXPENDITURES	8.40	7.84	9.52	9.52	9.52	26.10	39.30	29.96	28.87	19.70
TOTAL CONSTRUCTION REQUIREMENTS	16.67	78.77	105.50	133.03	90.55	32.26	46.01	29.96	28.87	19.70
BALANCE TO FINANCE	16.67	78.77	77.24	119.22	88.67	45.55	44.96	25.77	18.62	9.36
SOURCES OF FINANCE										
PROPOSED IBRD LOAN	.64	5.31	13.96	20.77	22.27	19.96	15.46	10.61	6.68	-
GOVERNMENT EQUITY CONTRIBUTIONS	16.03	73.46	63.28	98.45	66.40	25.59	29.50	15.16	11.94	9.36
BALANCE FINANCED	16.67	78.77	77.24	119.22	88.67	45.55	44.96	25.77	18.62	9.36
DEBT SERVICE COVERAGE (TIMES)	-	-	-	-	2.78	1.53	1.56	1.57	1.73	1.89

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

GECOS - HOMS - BALANCE SHEETS

SL MILLIONS

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
FISCAL YEAR ENDING DECEMBER 31										
ASSETS										
FIXED ASSETS										
ASSETS IN OPERATION	-	-	355.17	391.32	437.71	713.07	734.47	751.65	821.18	856.05
DEPRECIATION	-	-	116.68	126.97	139.35	163.77	189.94	216.79	246.24	277.08
NET FIXED ASSETS	-	-	238.49	264.35	298.36	549.30	544.53	534.86	574.94	578.97
WORK IN PROGRESS	16.67	95.44	134.20	231.08	275.24	32.14	56.75	69.53	28.87	13.70
TOTAL NET FIXED ASSETS	16.67	95.44	372.69	495.43	573.60	581.44	601.28	604.39	603.81	592.67
CURRENT ASSETS										
CASH	-	-	.23	.61	1.18	2.49	3.21	3.52	3.81	4.15
RECEIVABLES	-	-	1.98	4.38	5.93	10.67	13.03	13.81	15.06	16.10
INVENTORIES	-	-	.30	.67	1.43	4.94	9.06	9.98	10.82	11.80
TOTAL CURRENT ASSETS	-	-	2.51	5.66	8.54	17.50	25.30	27.31	29.69	32.05
TOTAL ASSETS	16.67	95.44	375.20	501.09	582.14	598.94	626.58	631.70	633.50	624.72
LIABILITIES										
GOVT.EQUITY CONT	16.03	89.49	329.25	427.09	494.09	519.68	549.17	564.34	576.27	585.63
RETAINED EARNINGS	-	-	-	-	-	(7.05)	(14.89)	(23.07)	(31.15)	(38.60)
TOTAL EQUITY	16.03	89.49	329.25	427.09	494.09	512.63	534.28	541.27	545.12	547.03
LONG-TERM DEBT										
IBRD LOAN	.64	5.95	19.91	36.24	49.61	60.67	67.24	68.94	66.73	57.83
CURRENT LIABILITIES										
ACCOUNTS PAYABLE	-	-	.18	.40	.72	2.55	4.66	5.10	5.54	6.03
SUPPLIERS	-	-	25.86	32.31	28.82	14.19	11.50	7.49	7.22	4.93
CURRENT MATURITIES	-	-	-	4.45	8.90	8.90	8.90	8.90	8.90	8.90
TOTAL CURRENT LIABILITIES	-	-	26.04	37.16	38.44	25.64	25.06	21.49	21.65	19.86
TOTAL LIABILITIES	16.67	95.44	375.20	501.09	582.14	598.94	626.58	631.70	633.50	624.72
Debt: Equity Ratio	-	-	6:94	8:92	9:91	11:89	11:89	11:89	11:89	10:90

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

GECOS - HAMA - INCOME STATEMENTS

S£ MILLIONS

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
FISCAL YEAR ENDING DECEMBER 31										
TOTAL POPULATION (000)	221.00	227.00	234.00	240.00	247.00	254.00	260.00	267.00	275.00	282.00
POPULATION SEWERED (000)	206.00	211.00	217.00	224.00	230.00	236.00	242.00	249.00	255.00	262.00
WATER CONSUMPTION (MCM)										
DOMESTIC & COMMERCIAL	11.99	12.46	12.94	13.44	13.96	14.48	15.01	15.56	16.13	16.73
INDUSTRIAL	.83	.85	.87	.89	.91	.93	.95	.97	.99	1.02
OPERATING REVENUES										
WATER SURCHARGE/FEE/TAXES	-	-	3.46	7.23	8.55	12.18	26.95	31.42	32.58	34.69
OTHER INCOME	-	-	.12	.23	.25	.28	.37	.44	.50	.56
TOTAL REVENUES	-	-	3.58	7.46	8.80	12.46	27.32	31.86	33.08	35.25
OPERATING EXPENSES										
SALARIES & WAGES	-	-	.52	1.02	1.11	2.13	4.77	6.11	6.55	7.14
MATERIALS & CHEMICALS	-	-	.20	.40	.44	.94	1.76	2.73	2.97	3.27
ELECTRICITY	-	-	-	-	-	-	2.08	2.97	3.24	3.53
ADMINISTRATION EXPENDITURES	-	-	.20	.40	.43	.64	1.08	1.33	1.46	1.59
MISCELLANEOUS	-	-	.07	.13	.15	.28	.56	.73	.80	.87
SUB-TOTAL	-	-	.99	1.95	2.13	3.99	10.25	13.87	15.02	16.40
DEPRECIATION	-	-	2.59	5.51	6.67	8.47	17.07	17.99	18.06	18.85
TOTAL OPERATING EXPENSES	-	-	3.58	7.46	8.80	12.46	27.32	31.86	33.08	35.25
NET OPERATING INCOME	-	-	(.00)	-	-	-	-	-	-	-
INTEREST	-	-	-	-	-	-	4.29	4.34	4.20	3.82
NET INCOME	-	-	(.00)	-	-	-	(4.29)	(4.34)	(4.20)	(3.82)
WORKING RATIO	-	-	28%	26%	24%	32%	38%	44%	45%	47%

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

GECOS - HAMA - FUNDS FLOW STATEMENTS

SL MILLIONS

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
FISCAL YEAR ENDING DECEMBER 31										
INTERNAL FUNDS GENERATION										
NET INTERNAL SOURCES BEFORE DEPRECIATION	-	-	2.59	5.51	6.67	8.47	17.07	17.99	18.06	18.85
OPERATING REQUIREMENTS										
INCREASE (DECREASE) IN WORKING CAPITAL	-	-	(11.18)	(1.38)	(5.11)	1.56	15.59	6.73	3.15	.78
DEBT SERVICE										
INTEREST	-	-	-	-	-	-	4.29	4.34	4.20	3.82
AMORTIZATION	-	-	-	-	3.24	6.49	6.49	6.49	6.49	6.49
TOTAL DEBT SERVICE	-	-	-	-	3.24	6.49	10.78	10.83	10.69	10.31
TOTAL OPERATING REQUIREMENTS	-	-	(11.18)	(1.38)	(1.87)	8.05	26.37	17.56	13.84	11.09
NET FUNDS AVAILABLE FROM OPERATIONS	-	-	13.78	6.89	8.54	.42	(9.30)	.43	4.22	7.76
CONSTRUCTION REQUIREMENTS										
PROPOSED PROJECT	1.05	20.79	46.82	59.28	81.72	52.51	4.79	5.26	-	-
CAPITALIZED INTEREST	.14	.14	.28	.81	1.94	3.33	-	-	-	-
OTHER CAPITAL EXPENDITURES	2.80	3.38	3.94	3.38	3.38	3.38	9 46	16.05	10.98	11.50
TOTAL CONSTRUCTION REQUIREMENTS	3.99	24.31	51.04	63.47	87.04	59.22	14.25	21.31	10.98	11.50
BALANCE TO FINANCE	3.99	24.31	37.26	56.58	78.50	58.80	23.55	20.88	6.76	3.74
SOURCES OF FINANCE										
PROPOSED IBRD LOAN	.07	.63	1.65	2.46	2.63	2.36	1.83	1.25	.79	-
AFESD LOAN	-	-	2.34	10.11	21.57	24.46	12.35	3.51	1.83	-
GOVERNMENT EQUITY CONTRIBUTIONS	3.92	23.68	33.27	44.01	54.30	31.98	9.37	16.12	4.14	3.74
BALANCE FINANCED	3.99	24.31	37.26	56.58	78.50	58.80	23.55	20.88	6.76	3.74
DEBT SERVICE COVERAGE (TIMES)	-	-	-	-	2.06	1.31	1.58	1.66	1.69	1.83

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

GECOS - HAMA - BALANCE SHEETS

SL MILLIONS

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
FISCAL YEAR ENDING DECEMBER 31										
FIXED ASSETS										
ASSETS IN OPERATION	-	-	189.31	203.59	223.34	248.59	450.34	463.99	468.79	497.99
DEPRECIATION	-	-	63.19	68.70	75.37	83.84	100.91	118.90	136.96	155.81
NET FIXED ASSETS	-	-	126.12	134.89	147.97	164.75	349.43	345.09	331.83	342.18
WORK IN PROGRESS	3.99	28.30	46.51	95.70	162.99	196.96	9.46	17.12	23.30	5.60
TOTAL NET FIXED ASSETS	3.99	28.30	172.63	230.59	310.96	361.71	358.89	362.21	355.13	347.78
CURRENT ASSETS										
CASH	-	-	.26	.51	.56	1.07	2.38	3.06	3.28	3.57
RECEIVABLES	-	-	1.18	2.46	2.90	3.11	6.83	7.96	8.27	8.31
INVENTORIES	-	-	.17	.33	.37	.78	1.47	2.27	2.47	2.72
TOTAL CURRENT ASSETS	-	-	1.61	3.30	3.83	4.96	10.68	13.29	14.02	15.11
TOTAL ASSETS	3.99	28.30	174.24	233.89	314.79	366.67	369.57	375.50	369.15	362.89
LIABILITIES										
GOVT.EQUITY CONT	3.92	27.60	156.76	200.78	255.09	287.06	296.43	312.55	316.69	320.43
RETAINED EARNINGS	-	-	-	-	-	-	(4.29)	(8.63)	(12.83)	(16.65)
TOTAL EQUITY	3.92	27.60	156.76	200.78	255.09	287.06	292.14	303.92	303.86	303.78
LONG-TERM DEBT										
IBRD LOAN	.07	.70	2.35	4.28	5.86	7.17	7.94	8.15	7.88	6.84
AFESD LOAN	-	-	2.34	9.73	25.86	44.88	51.79	49.86	46.25	40.81
TOTAL LONG-TERM DEBT	.07	.70	4.69	14.01	31.72	52.05	59.73	58.01	54.13	47.65
CURRENT LIABILITIES										
ACCOUNTS PAYABLE	-	-	.10	.20	.22	.40	1.23	1.76	1.92	2.10
SUPPLIERS	-	-	12.69	15.66	21.78	20.68	9.97	5.33	2.74	2.88
CURRENT MATURITIES	-	-	-	3.24	6.49	6.49	6.49	6.49	6.49	6.49
TOTAL CURRENT LIABILITIES	-	-	12.79	19.10	27.98	27.56	17.70	13.57	11.15	11.46
TOTAL LIABILITIES	3.99	28.30	174.24	233.89	314.79	366.67	369.57	375.50	369.15	362.89
Debt: Equity Ratio	-	-	3:97	7:93	11:89	15:85	17:83	16:84	15:85	14:86

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

ASSUMPTION FOR THE FINANCIAL PROJECTIONS

Income Statement

1. Operating costs were escalated to cover inflation as follows:

1984	- 10.0%
1985	- 9.0%
1986-93	9.0%

The income from water surcharge/fees/taxes was calculated to comply with the proposed financial covenant that GECOS would set tariff, fees and taxes at a level to provide income to cover operating costs including depreciation.

2. Other income includes the sewerage levy which is collected by the municipality and income from the sale of compost material.

3. Salaries and wages were calculated on the basis of the new structure proposed by the draft legislative decree allowing for the establishment of the sewerage companies. It was assumed that the GECOS would gradually build up their sewer maintenance staff over the two and a half year period June 1986-1988 and that the treatment plant would be operational in 1989 in Homs and in 1990 in Hama.

4. The following depreciation rates were used:

Existing sewers	2.5%
New Sewers	2.5%
Civil Works	2.5%
Mechanical and Electrical Equipment	6.6%
Vehicles	20%

Funds Flow Statement

5. It was assumed that the balance of finance required for investment would be provided by the Government as an equity contribution.

Balance Sheet

6. The value of the existing sewer systems are provided for at their estimated 1986 current costs. These are based on the consultants estimate of the replacement cost of the system in 1977 prices plus the replacement cost of sewers built from 1977 to 1986, less 33% for poor construction and maintenance and less estimated cumulative depreciation. The net value of the Homs system at SE176.48 million and the Hama system at SE95.89 million are reasonable and have been treated as equity on the assumption that the system would be transferred to GECOS free of charge. The project assets were not revaluated.

ANNEX 13

SYRIAN ARAB REPUBLIC

HOMS & HAMA SEWERAGE PROJECT

SELECTED DOCUMENTS IN PROJECT FILE

Sector Reports and Studies

A. 1 Draft Legislative Decree Creating Public Establishments for Water Supply and Sewerage

Reports by Howard Humphreys & Sons, England

B. 1 "Homs Sewage Treatment: Pre-Investment Study":
Volume 1 - Summary and Recommendations
Volume 2 - Population, Water Consumption and Sewage Flow Projections
Volume 3 - Engineering and Economic Appraisal
Volume 4 - Preliminary Engineering Design and Financial Programme
Volume 5 - Appendices

B. 2 "Hama Sewage Treatment: Pre-Investment Study"
(Same five volumes as in Homs Report).

B. 3 "Inventory of Sources of Pollution - Assi River" (Interim Report).

B. 4 "Institutional Studies - National Water Pollution Control".

B. 5 "Sewerage Institutional Studies - Damascus, Homs and Hama".

B. 6 "Homs Sewage Treatment Plant - Design Report".

B. 7 "Hama Sewage Treatment Plant - Design Report".
Reports prepared for Ministry of Housing and Utilities by Review and Guidance Panel:

B. 8 Report Number 1: March 1978.

B. 9 Report Number 2: July 1978.

B.10 Report Number 3: December 1978.

Project Documentation Prepared by Bank Staff

C. 1 Evaluation of Sewage Treatment Alternatives in Homs & Hama.

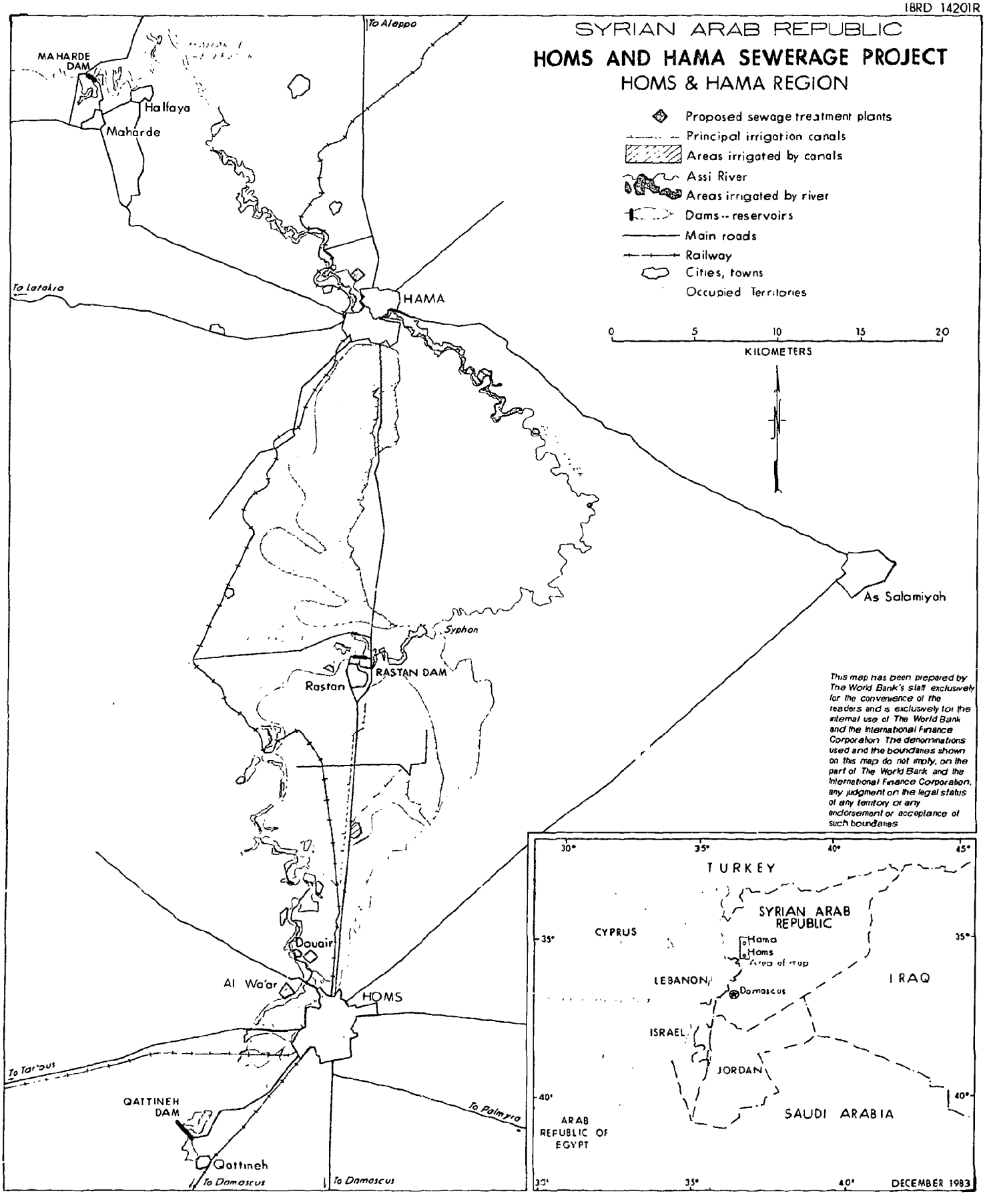
C. 2 Detailed Description of Project Components.

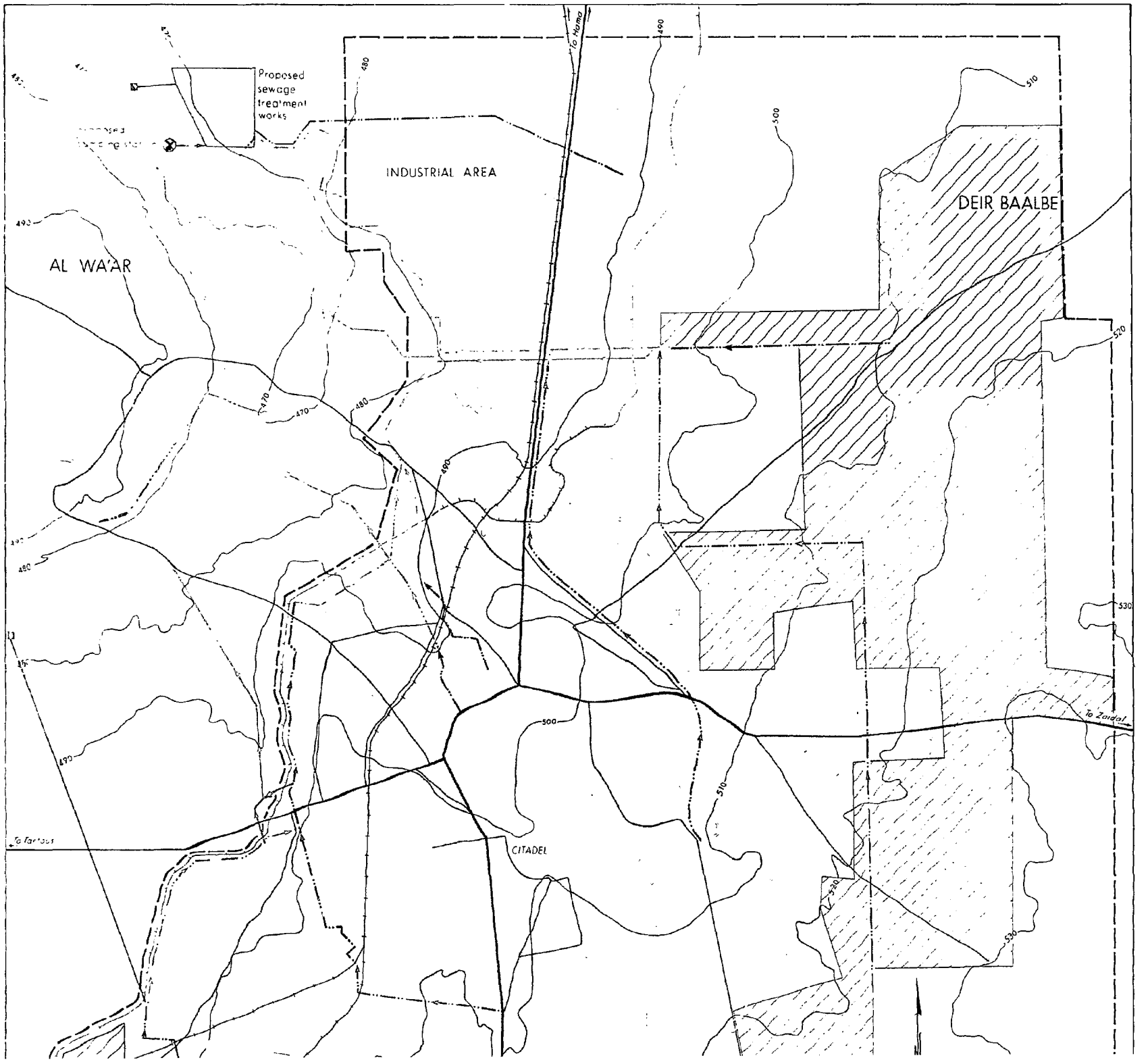
C. 3 Projected Pollution Loads Discharged to Sewers.

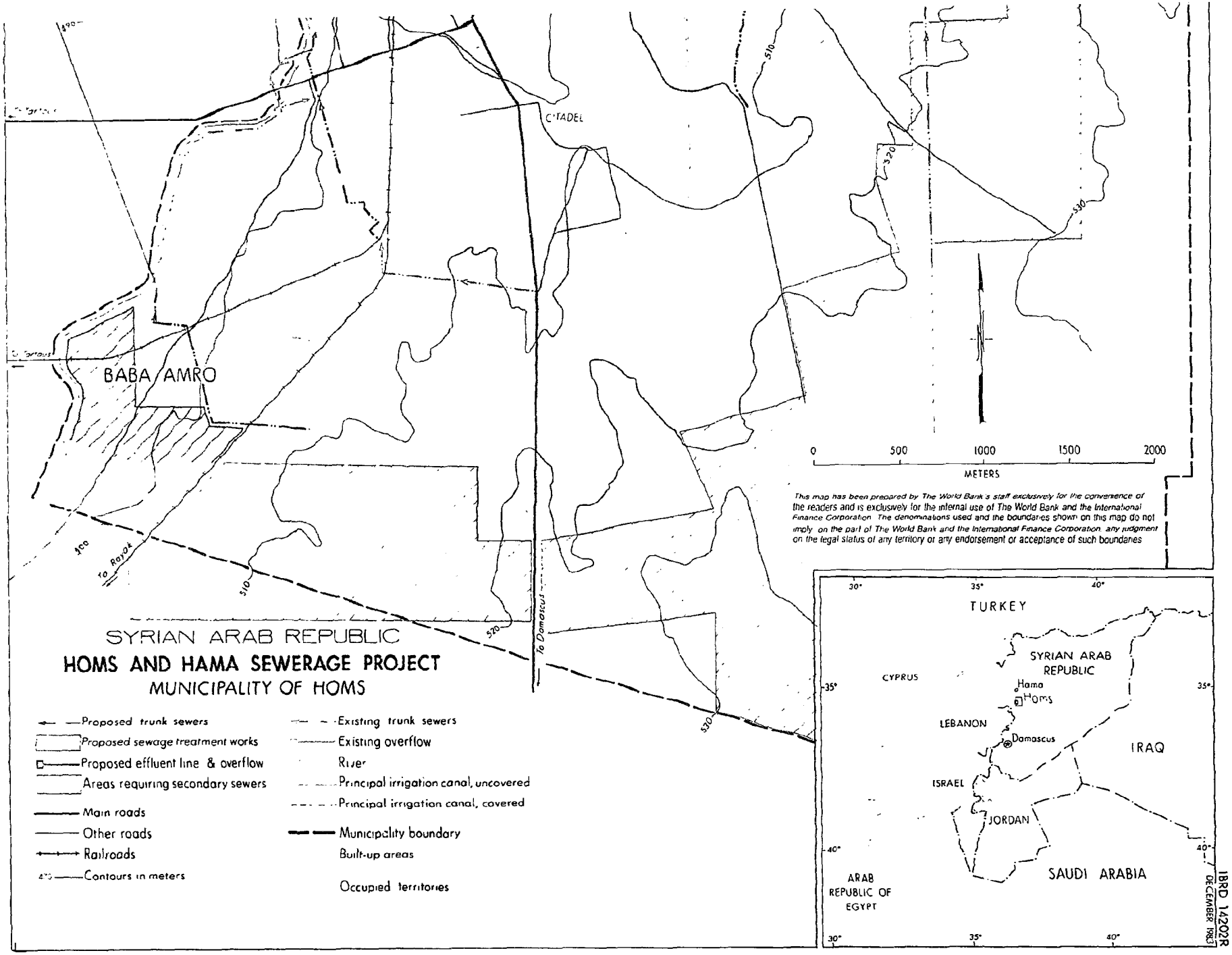
C. 4 Long-term Average Incremental Cost.

IBRD 14201R

SYRIAN ARAB REPUBLIC
HOMS AND HAMA SEWERAGE PROJECT
HOMS & HAMA REGION




Proposed sewage treatment works
INDUSTRIAL AREA
DEIR BAALBE
AL WA'AR
To Homs
To Zaidal
To Tartous
CITADEL
470
480
490
500
510
520
530



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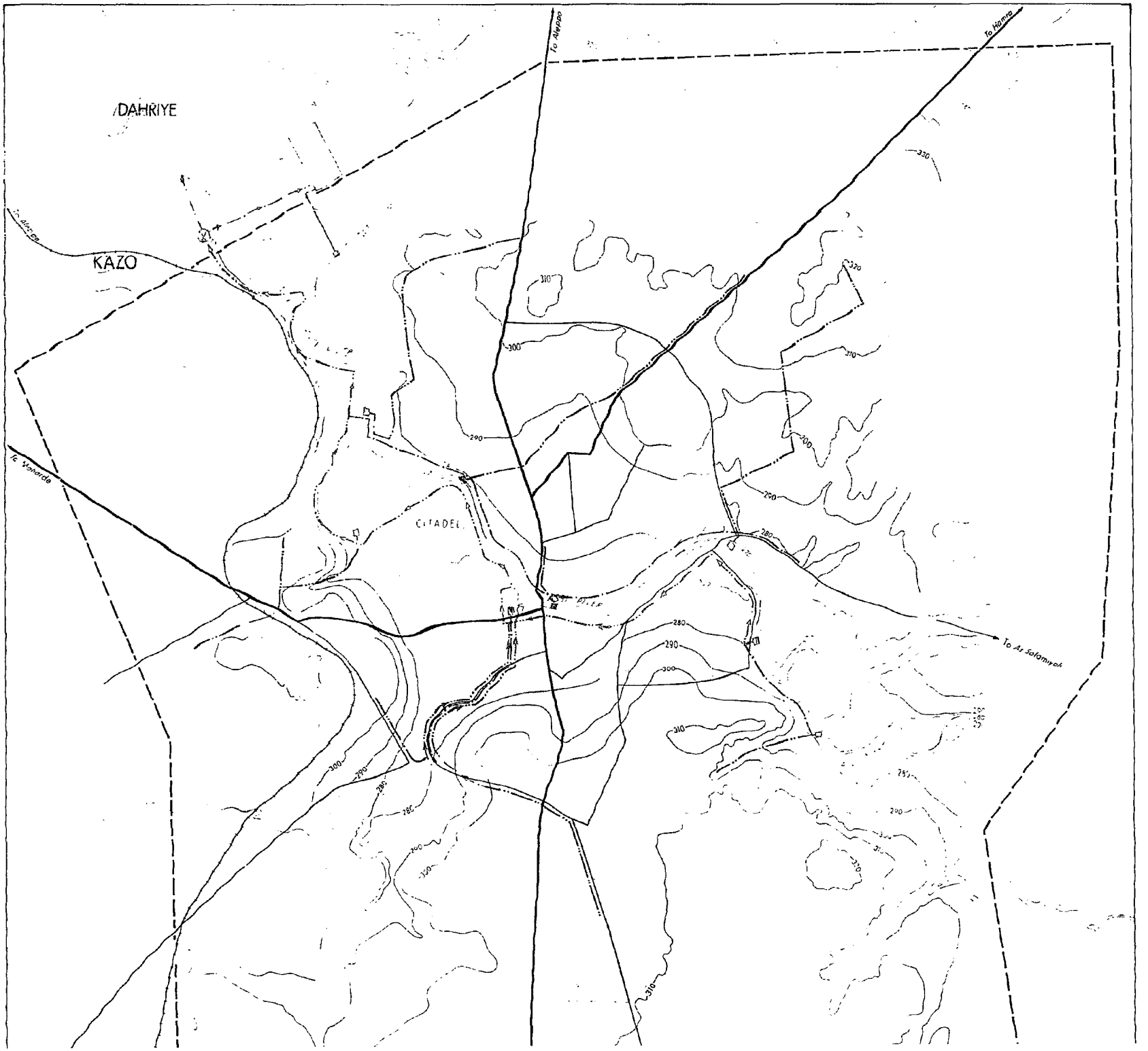
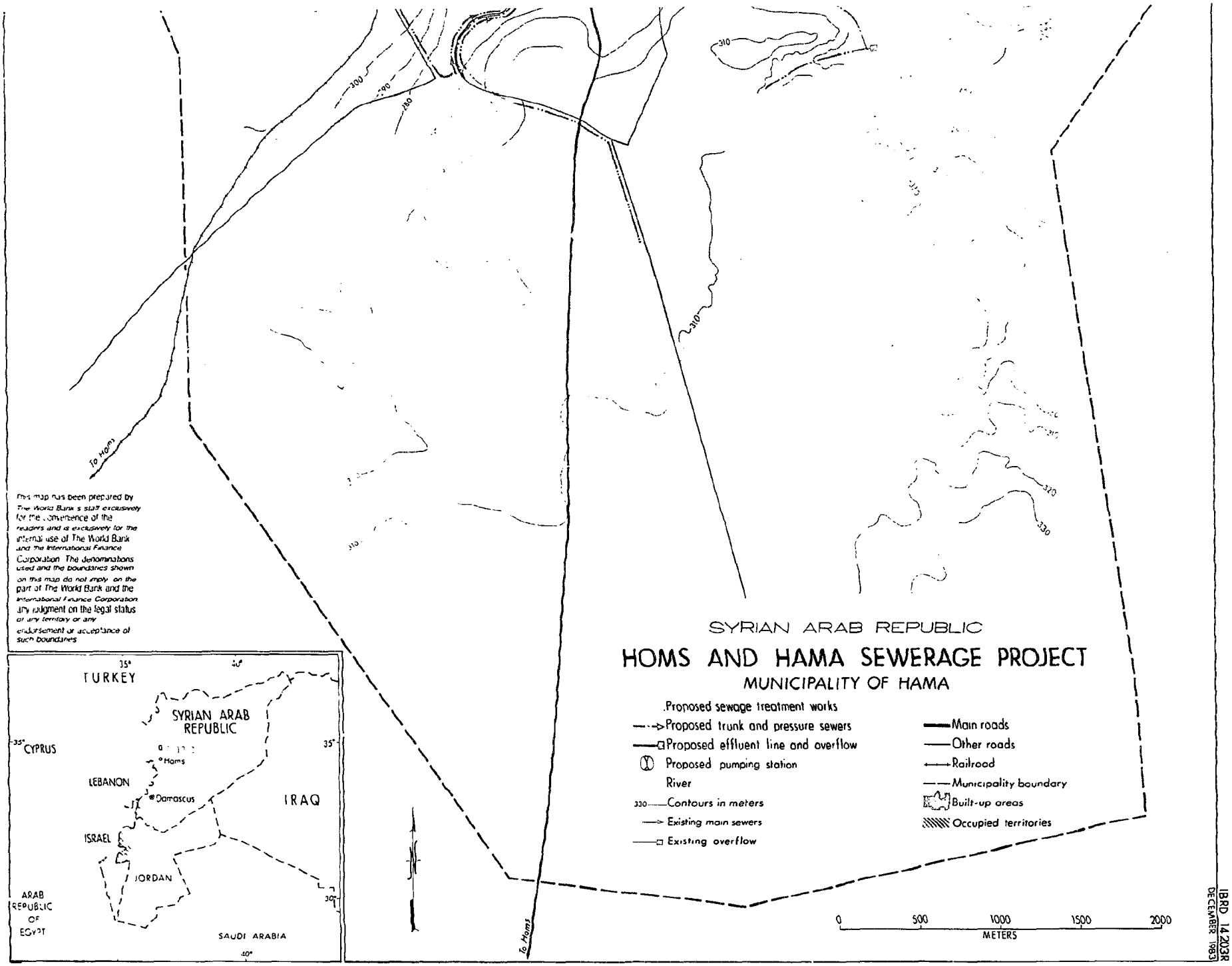

DAHRIYE
KAZO
To Aleppo
To Hama
To Homs
To As Salamiyah
CITADEL
330
320
310
300
290
280



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